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REPORT OF

COOPERATIVE BLISTER RUST CONTROL WORK

IN THE NORTHEASTERN STATES

DURING 1933

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FOREWORD

This report is based on a summarization and analysis of the yearly statistical forms submitted by the state leaders, and on general observations made by the federal supervisor. It summarizes the control work performed in the Northeastern States for all years, and especially gives the pertinent facts regarding the 1933 activities. No attempt has been made to discuss future plans in this report. Such plans, particularly for 1934, have been prepared for each cooperating state. As copies of these plans have been furnished the state and federal offices, it does not appear advisable to repeat this information here.

Previous annual reports for this region have included special summaries of cooperative control activities conducted in each of the Northeastern States since 1918. The 1933 report does not contain such statements as it was considered undesirable to further delay submitting the report in order to compile the necessary data. It is expected such information will be presented in a supplementary statement which will be prepared next fall. The delay in submitting the 1933 report has been due chiefly to lack of cost figures for the various projects. A complete set of the B.R.C.-6 reports, listing federal and state expenditures for 1933, was not available to the Boston Office until July, 1934.

[illegible]

BLISTER RUST CONTROL IN THE NORTHEASTERN STATES

SCOPE OF THE PROBLEM

White Pine

The white pine growth in New England and New York comprises 7,283,399 acres and has a normal commercial value of over 300 million dollars. This acreage is classified as follows: Pure pine (80 per cent or over), 2,714,182 acres; mixed pine (21-79 per cent pine in mixture), 2,791,833 acres; and pine stocking and re-stocking in other types, 1,777,884 acres. Of the total pine acreage, 75.1 per cent is located in the three States of Maine, New Hampshire, and New York. A similar survey in Pennsylvania and New Jersey revealed a total of 378,978 acres of white pine. In the latter state, the white pine is confined to ornamental and forest plantings and to small scattered areas of natural growth in the northern part of the state. In addition, throughout the Northeastern States, there are vast areas of mixed growth with pine stocking of less than 20 per cent. Also, millions of white pines are being planted each year; as for example, 3,041,843 white pines were distributed from the New York State nurseries in 1933.

Table 1.- Acreage of White Pine in Northeastern States

State	Pure White Pine (80-100% white pine)		Mixed Types Containing White Pine		White Pine (above restocking size) in Other Types *	White Pine Restocking in all Types Except "Pure Pine Under 6" DBH	Total* (Excluding acreage restocking to pine)
	6" and over DBH	Under 6" DBH	30-79%	21-29%			
Me.	304,790	284,490	794,915	248,258	976,458	1,703,727	2,608,911
N.H.	263,526	548,225	278,366	296,439	157,477	396,558	1,544,033
Vt.	29,923	73,453	160,147	78,415	225,146	296,733	567,084
Mass.	162,113	288,686	273,266	63,765	170,734	333,085	958,564
R.I.	13,343	436	-	-	59,417	59,417	73,196
Conn.	32,697	40,729	66,551	57,794	18,383	53,071	216,154
N.Y.	214,600	457,171	242,218	231,699	170,269	286,104	1,315,957
N.E.& N.Y.	1,020,992	1,693,190	1,815,463	976,370	1,777,884	3,128,695	7,283,899
N.J.	50	1,000	100	200	2,000	2,000	3,350
Pa.	51,854	40,043	28,078	98,023	157,630	226,292	375,628
All States	1,072,896	1,734,233	1,843,641	1,074,593	1,937,514	3,356,987	7,662,877

*Excludes those "other types" which have 1-20 per cent white pine (above restocking size) but do not contain white pine restocking.

[illegible] RUST CONTROL IN THE NORTHEASTERN STATES

SCOPE OF THE PROBLEM

White Pine

The white pine growth in New England and New York comprises 7,263,799 acres and has a normal commercial value of over 300 million dollars. This acreage is classified as follows: Pure pine (80 per cent or over), 2,714,182 acres; mixed pine (21-79 per cent pine in mixture), 2,791,823 acres; and pine stocking and re-stocking in other types, 1,777,194 acres. Of the total pine acreage, 75.1 per cent is located in the three States of Maine, New Hampshire, and New York. A similar survey in Pennsylvania and New Jersey revealed a total of 715,976 acres of white pine. In the latter state, the white pine is confined to ornamental and forest plantings and to small scattered areas of natural growth in the northern part of the state. In addition, throughout the Northeastern States, there are vast areas of cut-over with pine stocking of less than 20 per cent. Also, millions of white pines are being planted each year; as for example, 5,041,643 white pines were distributed from the New York State nurseries in 1925.

Table 1.- Acreage of White Pine in Northeastern States

State	Pure White Pine (80-100% white pine)		Mixed Types Containing White Pine		White Pine (pure & re-stocking) in Other Types*	White Pine Restocking in all Types Except "Pure Pine Under 5" DBH	Total* (Including acreage restocking to pine)
	5" and over DBH	Under 5" DBH	20-79%	21-29%			
Me.	104,790	284,430	194,315	294,238	276,448	1,734,727	3,608,911
N.H.	263,556	414,180	276,705	293,427	151,471	756,854	1,444,013
Vt.	29,925	73,415	160,147	78,415	225,146	256,727	561,084
Mass.	168,113	254,686	272,263	63,705	170,734	372,025	976,944
R.I.	12,343	446	-	-	29,417	74,417	73,195
Conn.	32,837	40,729	96,351	71,794	16,352	53,071	215,134
N.Y.	214,000	402,171	242,210	271,099	170,659	256,104	1,318,911
Pa.	1,050,952	1,092,190	1,218,402	976,370	1,111,884	3,128,695	7,284,393
N.J.	50	1,000	100	200	2,000	2,000	3,350
Tot.	71,854	40,043	26,076	98,024	151,650	256,042	173,586
[illegible]	1,072,236	1,124,232	1,042,842	1,044,293	1,212,414	3,256,921	1,668,477

*Includes those "other types" which have 1-20 per cent white pine (above restocking size) but do not contain white pine restocking.

Table 2.- Commercial Value of White Pine in Northeastern States

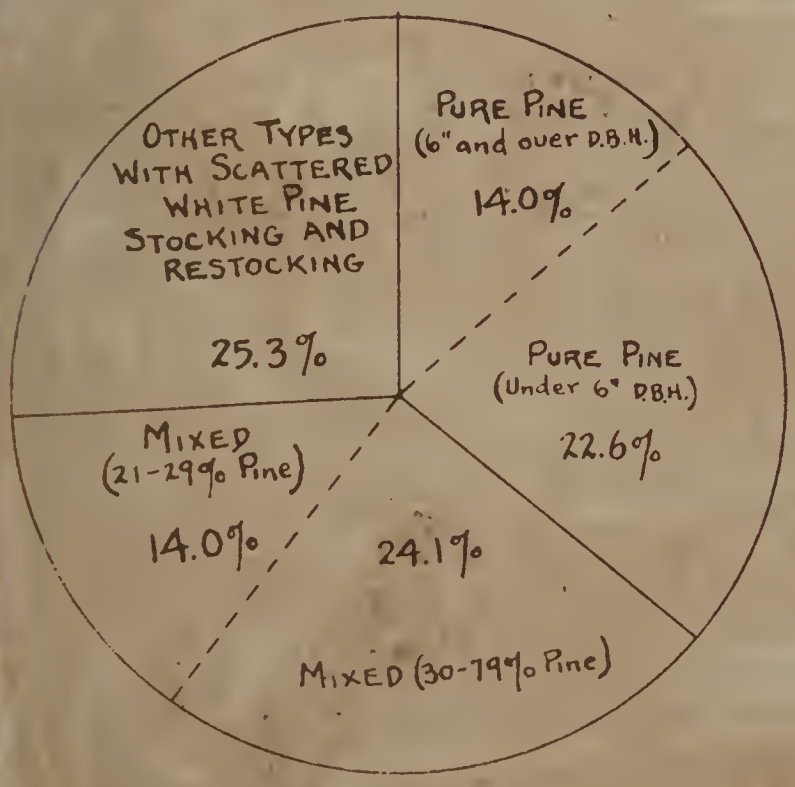
State	Pure White Pine (80-100% white pine)		Mixed Types Containing White Pine		White Pine (above restocking size) in Other Types"	White Pine Restocking in all Types Except "Pure Pine Under 6" DBH	Total (Including white pine restocking)
	6" and Over DBH	Under 6" DBH	30-79%	21-29%			
Me.	$ 34,136,480	$ 7,112,250	$ 44,515,240	$ 6,951,224	$ 6,835,206	$2,559,199	$102,109,599
N.H.	29,514,912	13,705,625	15,588,496	8,300,292	1,102,339	707,534	68,919,198
Vt.	3,351,376	1,836,325	8,968,232	2,195,620	1,576,022	412,279	18,339,854
Mass.	18,156,656	7,217,150	15,302,896	1,785,420	1,195,138	599,752	44,257,012
R. I.	1,494,416	10,900	-	-	415,919	80,818	2,002,053
Conn.	3,662,064	1,018,225	3,726,856	1,618,232	128,681	86,358	10,240,416
N.Y.	24,035,200	11,429,275	13,564,208	6,487,572	1,191,883	419,084	57,127,222
N.E.& N.Y.	114,351,104	42,329,750	101,665,928	27,338,360	12,445,188	4,865,024	302,995,354
N.J.	5,600	25,000	5,600	5,600	14,000	2,000	57,800
Pa.	5,807,648	1,021,075	1,572,368	2,744,644	1,103,410	226,292	12,475,437
All States	$120,164,352	$43,375,825	$103,243,896	$30,088,604	$13,562,598	$5,093,316	$315,528,591

*Excludes those "other types" which have 1-20 per cent white pine (above restocking size) but do not contain white pine restocking.

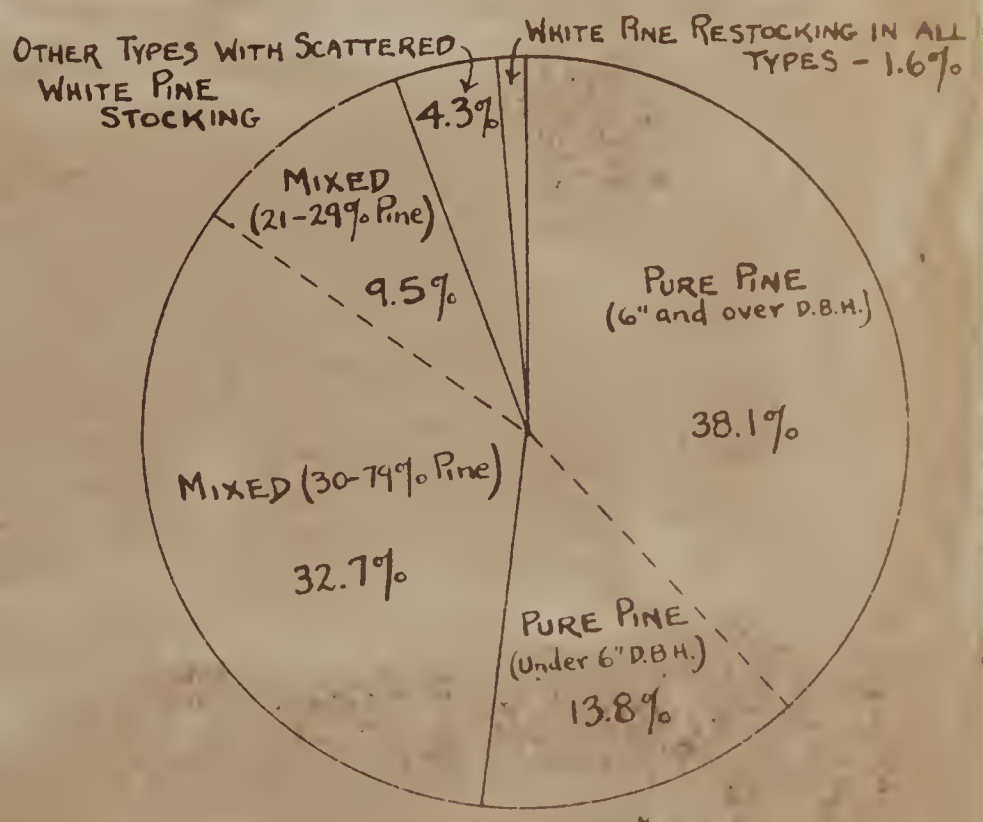
Basis for estimating value of merchantable white pines: stumpage figured at normal value of $7.00 per M - average volume per acre, pure merchantable white pine = 16 M board feet, mixed white pine 30-79% = 8 M board feet, mixed white pine, 20-29% = 4 M board feet, and white pine, above restocking size, in other types = 1 M board feet. Pure stands of white pine under 6" DBH given normal value of $25.00 per acre.

Basis for estimating normal per acre value of white pine restocking: degree of restocking, light = $1.00, medium = $2.00, heavy = $3,00.

ACREAGE AND COMMERCIAL VALUE OF WHITE PINE IN THE NORTHEASTERN STATES.



ACREAGE - 7,662,877



COMMERCIAL VALUE - $315,528,591.

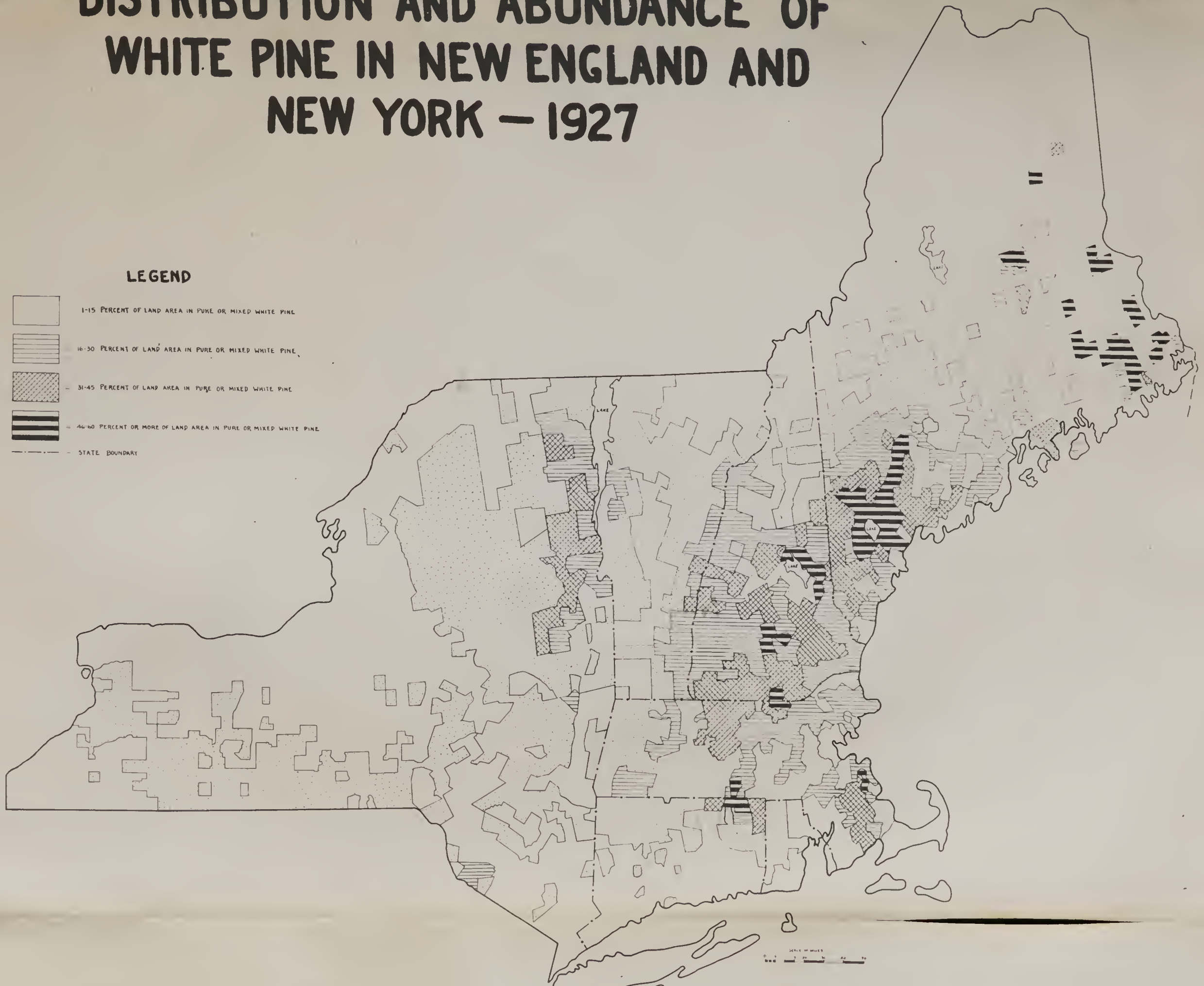
State	Zero White Time (60–100% white time)		Mixed Types Overlapping White Time		White Time Before Restocking (Above restocking in all Types "Other" Types)	White Time Restocking (Zero in all Types "Other Types" Follow Under Restocking Rate)
	Open Over Dry	Under "Other" DSS	70–79%	0–29%		

*Zero-time times "other types" would have 1–50 per cent white time (above restocking) but do not contain white time restocking.

Basis for estimating value of conservable white pines: stumpage limited at normal value of $7.00 per M - Zero-to-5 volume per acre; some merchantable white pine, 50–75% = 5 M board feet, mixed white pine 30–49% = 3 M board feet, mixed white pine, where restocking else, in other types = 1 M board feet. Zone stands of white pine under 6" DBH given normal value at $2.00 per acre.

Basis for estimating normal new crop value of white pine restocking: degree of restocking, light = $1.00, medium = $2.00, heavy = $3.00.

DISTRIBUTION AND ABUNDANCE OF WHITE PINE IN NEW ENGLAND AND NEW YORK — 1927



Ribes

Wild Ribes occur more or less generally distributed throughout the white pine region of the Northeastern States, but vary locally as to site, species, size, and abundance. Nine indigenous species have been encountered in control work, four being gooseberries and five currants, exclusive of Ribes vulgare which is considered an escaped cultivated red currant. In certain sites, the Ribes number 100 or more per acre, and in others are few or entirely absent. The aggregate, however, represents many millions of such bushes, as evidenced by the eradication of 103,691,617 wild Ribes in New England and New York during the period 1918 to 1933, inclusive. It has been determined by Fivaz that shade is an important factor in eliminating and suppressing Ribes, that Ribes seed remain dormant and viable in the duff for years, and that disturbance of the duff by logging, fire, animals, or mechanical means favors the germination of such dormant seeds. Therefore, Ribes are found most abundant in open situations, such as recently cut-over or burned areas, pastures, swamps, fence rows, etc. The amount and distribution of wild Ribes per acre, based on town units, is designated on the following map. The cultivated Ribes problem is indicated by the 723,196 cultivated bushes that have been destroyed in applying control measures since 1918.

Infection

Blister rust infection is general throughout the commercial white pine range of the Northeastern and Lake States. Over extensive areas, from 1 to 20 per cent or more of the pines are infected; and in many local pine tracts, from 50 to 100 per cent of the trees are dead or dying. The amount of disease varies considerably in different localities, and is directly influenced by such factors as the number of original infection centers caused by the planting of imported diseased pine, the distribution and amount of native pine, association of pine and Ribes, abundance of Ribes, climatic conditions, and the application of control measures. In Essex and Warren Counties, New York, and in the upper Connecticut River valley region, where Ribes are generally abundant, pine infection is also heaviest; 11 to 20 per cent or more of the trees being diseased. In southern New England and in most of southern New York, less than one per cent of the pines are infected, except in a few limited areas.

Studies have shown that little or no new pine infection has occurred in areas which have been kept under protection, whereas in unprotected areas within the infested regions new infections are taking place at an alarming rate. During December, 1933, a strip line survey was conducted in eastern Maine to determine the amount of blister rust infection on white pines in unprotected areas. All pines twenty feet or less in height were carefully inspected on a rod wide strip totalling 23.5 miles in length. Twenty-seven per cent of the 5,369 pines examined were found to be fatally diseased with blister rust, and over seventy-four per cent of the cankers had originated since 1925. This study indicates the urgent need for applying control measures in unprotected areas.

The distribution and amount of disease based on township units in New England and New York is shown on the following map. A direct correlation between pine infection and abundance of Ribes is apparent when this map is compared with the Ribes map on Page 5.

The disease has been established in Pennsylvania and the Lake States about as long as in New England and New York, but due chiefly to fewer importations of infected stock and localization of native pine areas, it has not developed and spread as rapidly as in the latter section. However, during recent years, the amount and extent of the disease in Pennsylvania and the Lake States has increased at an alarming rate and the need for general application of control measures has become most urgent.

Ribes

Wild Ribes occur more or less generally distributed throughout the white pine region of the Northeastern States, but vary locally as to site, species, size, and abundance. Nine indigenous species have been encountered in control work, four being gooseberries and five currants, exclusive of Ribes vulgare which is considered an escaped cultivated red currant. In certain sites, the Ribes number 100 or more per acre, and in others are few or entirely absent. The aggregate, however, represents many millions of each species, as evidenced by the eradication of 102,092,017 wild Ribes in Maryland and New York during the period 1918 to 1923, inclusive. It has been determined by five that shade is an important factor in eliminating and suppressing Ribes, that Ribes seed remain dormant and viable in the duff for years, and that disturbance of the duff by logging, fire, animals, or mechanical means favors the germination of such dormant seeds. Therefore, Ribes are found most abundant in open situations, such as recently cut-over or burned areas, pastures, swamps, fence rows, etc. The amount and distribution of wild Ribes per acre, based on town units, is designated on the following map. The cultivated Ribes problem is indicated by the 723,156 cultivated bushes that have been destroyed in applying control measures since 1918.

Infection

White pine rust infection is general throughout the commercial white pine ranges of the Northeastern and Lake States. Over restrictive areas, from 1 to 20 per cent or more of the pines are infected; and in many local pine tracts, from 50 to 100 per cent of the trees are dead or dying. The amount of disease varies considerably in different localities, and is directly influenced by such factors as the number of original infection centers caused by the planting of imported diseased pine, the distribution and amount of native pine, association of pine and Ribes, abundance of Ribes, climatic conditions, and the application of control measures. In Essex and Warren Counties, New York, and in the upper Connecticut River valley region, where Ribes are generally abundant, pine infection is also heavier; 11 to 20 per cent or more of the trees being diseased. In southern New England and in most of northern New York, less than one per cent of the pines are infected, except in a few limited areas.

Studies have shown that little or no new pine infection has occurred in areas which have been kept under protection, whereas in unprotected areas within the infected regions new infections are taking place at an alarming rate. During December, 1923, a strip line survey was conducted in western Maine to determine the amount of blister rust infection on white pines in unprotected areas. All pines twenty feet or less in height were carefully inspected on a rod wide strip totalling 63.5 miles in length. Seventy-seven per cent of the 5,309 pines examined were found to be fatally diseased with blister rust, and over seventy-four per cent of the cankers had originated before 1923. This study indicates the urgent need for applying control measures in unprotected areas.

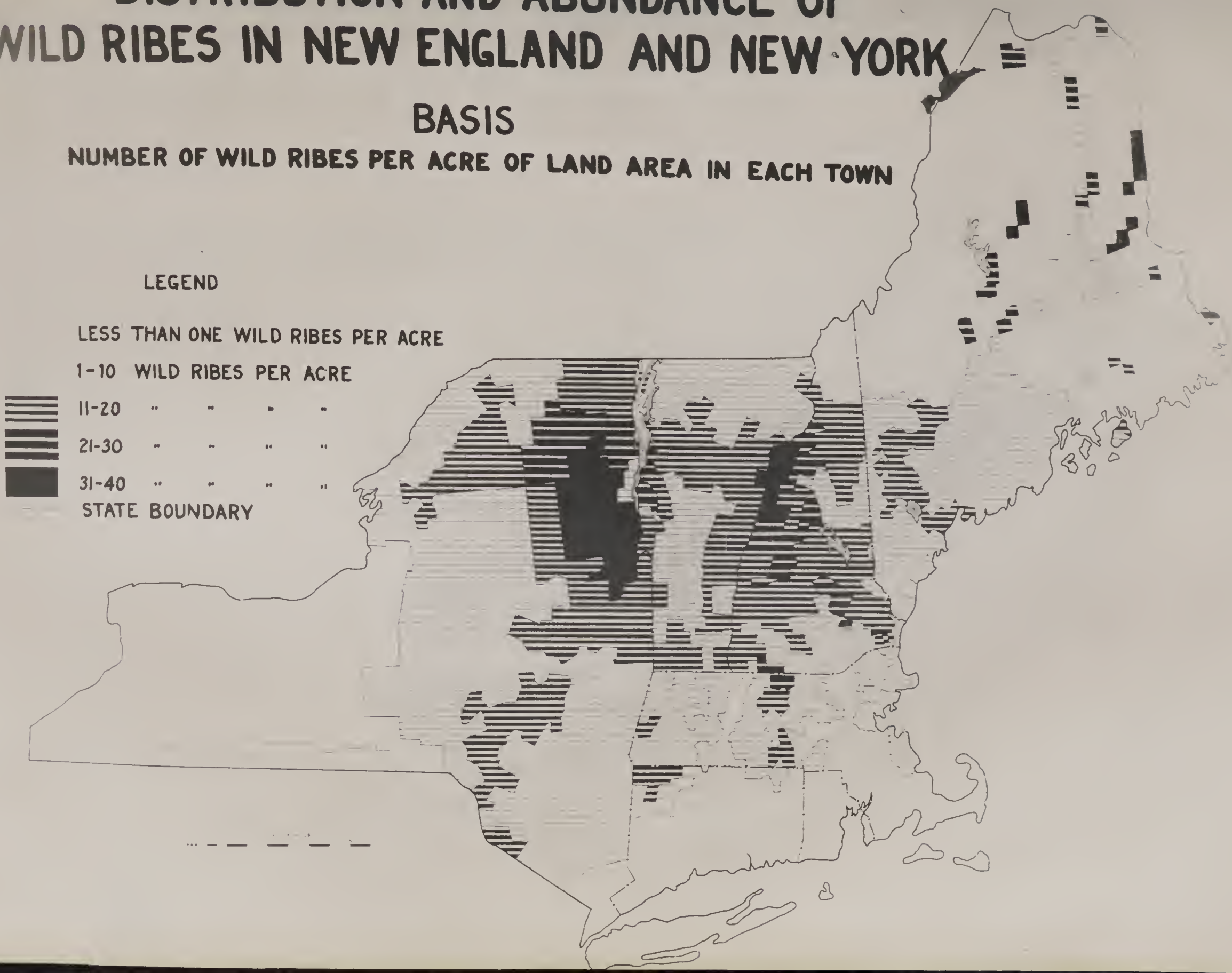
The distribution and amount of disease based on township units in New England and New York is shown on the following map. A direct correlation between pine infection and abundance of Ribes is apparent when this map is compared with the Ribes map on Page 5.

The disease has been established in Pennsylvania and the Lake States about as in New England and New York, but due chiefly to fewer importations of infected stock and localization of native pine areas, it has not developed and spread as rapidly as in the latter section. However, during recent years, the amount and extent of the disease in Pennsylvania and the Lake States has increased at an alarming rate and the need for general application of control measures has become most urgent.

DISTRIBUTION AND ABUNDANCE OF WILD RIBES IN NEW ENGLAND AND NEW YORK

BASIS

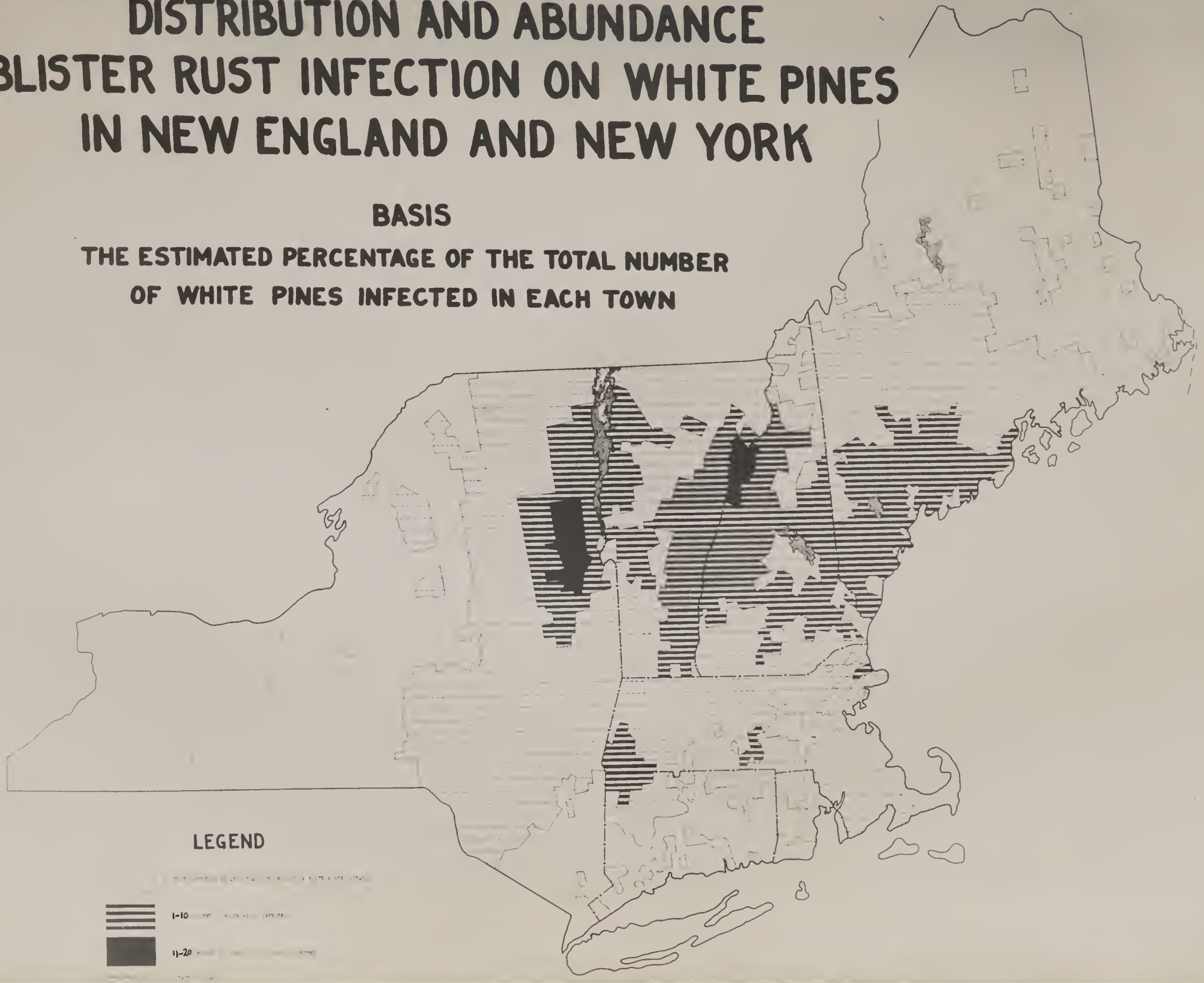
NUMBER OF WILD RIBES PER ACRE OF LAND AREA IN EACH TOWN



DISTRIBUTION AND ABUNDANCE BLISTER RUST INFECTION ON WHITE PINES IN NEW ENGLAND AND NEW YORK

BASIS

THE ESTIMATED PERCENTAGE OF THE TOTAL NUMBER OF WHITE PINES INFECTED IN EACH TOWN



POLICY

During the period 1918 to 1921, inclusive, the Federal Government cooperated with the states in experimental control work on a dollar for dollar basis. This work was conducted in each state under a cooperative agreement between the United States Department of Agriculture and the authorized state regulatory agency, the latter usually being the state forestry department. The control work was directed by the state officials under the general supervision of the Government, which paid a part of the Ribes eradication costs.

In 1922, a new program to secure the general application of control measures was initiated by the United States Department of Agriculture, the state regulatory agencies, and the state extension services. This program has been in operation since that time. The object of this cooperative work is to accomplish the control of blister rust by providing pine owners with the expert advice, leadership, and supervision needed to secure prompt and effective local eradication of Ribes in the pine growing regions. The Government is primarily responsible for furnishing each cooperating state with one or more trained agents, who function as leaders in control work. In addition, the Government conducts experiments and demonstrations to improve control practices, obtains data on spread of the rust, and gives general supervision and regional leadership. All Federal cooperative expenditures are offset by state expenditures of at least equal amount. The cooperating state regulatory agencies are responsible for the following: (1) the administrative direction of the employees furnished by the Government; (2) cooperation with counties, townships, associations, and individuals in control work; (3) adequate supervision and checking of local eradication of Ribes to secure effective destruction of such bushes; and (4), enforcement of any necessary regulatory measures. The state extension services cooperate, wherever practicable, by making available such facilities of their organizationsas will promote the control program.

In New England and New York, this program has been in successful operation since its adoption in 1922. However, in the Lake States, Pennsylvania, and New Jersey, the control activities were not organized on a similar basis until 1929. There are several reasons for the restriction of the control activities outside New England and New York. The principal ones are the few original introductions of the disease and its relatively slow establishment and spread, the scattered distribution of the white pine, the passive public interest in forestry and lack of adequate state appropriations for control work. Hence, up to 1929, cooperative activities outside New England and New York were limited to a small amount of scouting, eradication of new centers of infection, and to investigational and informational work. The natural spread of the disease during the past four years has greatly increased the infested area outside New England and New York. As a result, definite control programs have been adopted in Pennsylvania, New Jersey, Michigan, Wisconsin, and Minnesota, and a limited amount of control work performed.

During 1933, the regular cooperative work was necessarily curtailed due to the Emergency programs. The blister rust agents continued to supervise all control activities in their districts, including the Emergency projects, the latter being paid entirely from federal funds.

BLISTER RUST CONTROL ACTIVITIES IN THE NORTHEASTERN STATES

INFORMATIONAL AND SERVICE

Successful informational and service activities are essential to secure the cooperation of individuals and towns in the application of control measures. The informational features are used to create general and favorable attention, interest and desire; while the service work is required to obtain general, prompt, and effective cooperation.

The number of district agents in the cooperating states has not been uniform or constant; consequently, no satisfactory comparison can be made of the volume of the informational and service work performed in the different states, based on total figures. Table 6 indicates a general decrease in the use of informational features during the past few years. This is due to fewer agents being employed and to the fact that such activities have purposely not been emphasized as strongly as during the early years of the program. The control work has now reached a stage where the chief objective is to retain public interest in maintaining control and this can be accomplished with a reduced volume of informational features.

No attempt has been made this year to compare results of the informational and service activities in the various states on the basis of the work of the average agent in each state. The agents' activities in connection with the E.C.W. and N.R.A. programs necessarily increased their supervisory work and resulted in a curtailment of the informational and service features, especially the latter. However, as most of the informational activities are ordinarily performed during the winter and early spring months, the emergency programs did not materially affect the volume of such work. In fact, compared with the previous year, there was an increase in the number of meetings and only nominal decreases occurred in the other informational items.

A summary of the informational and service work performed by the district blister rust control agents in New England and New York during 1933 and for the period 1923 - 1933, inclusive, is given in Tables 3 to 6.

Table 3.- Informational Activities Performed in Each of the Northeastern States During 1933 by the Permanent District Agents

State	Me.	N.H.	Vt.	Mass.	R.I.	N.Y.	N.E.& N.Y.
Meetings Addressed	7	119	9	17	17	66	235
Field Demonstration Meetings	-	32	3	3	-	3	41
Displays Placed	-	18	17	5	1	9	50
Mimeo. Articles Distributed	581	2,741	22	71	-	20	3,435
Publications Distributed	1,320	8,343	2,950	8,376	1,625	5,077	27,691
Items Published	18	101	37	37	48	92	333
Posters and Signs Placed	121	149	442	20	-	397	1,129
Roadside Demonstrations Placed	4	5	3	18	-	1	31

Table 4.- Service Activities Performed in Each of the Northeastern States During 1933 by Permanent District Agents
(Interviews Classified by Purpose)

State	Initial Interviews				Follow-Up Calls				Personal Instruction in Field No. Individuals
	Erad. of Wild and Cult. Ribes	Erad.of Cult. Ribes Only	General Support Only	Total	Erad. of Wild and Cult. Ribes	Erad.of Cult. Ribes Only	General Support Only	Total	
Maine	3	20	470	493	3	1	253	257	54
N.H.	32	26	867	925	18	4	1,174	1,196	547
Vt.	552	34	277	863	318	23	17	358	418
Mass.	532	138	413	1,083	110	100	49	259	478
R.I.	-	9	301	310	-	-	470	470	29
N.Y.	599	161	354	1,114	782	65	357	1,204	292
Totals	1,718	388	2,682	4,788	1,231	193	2,320	3,744	1,818

No permanent district agents employed in Connecticut and Pennsylvania.

Table 3.- Informational Activities Performed in Each of the Northeastern States
During 1973 by the Permanent District Agents

State	U.S.	F.H.	Vc.	Educ.	F.I.	4-I.	H.E.
Meetings Attended	7	119	3	17	17	65	
Field Demonstration Meetings	-	32	3	5	-	3	
Displays Placed	-	18	17	5	1	3	
Exhibits Distributed	251	3,741	52	71	-	20	
Publications Distributed	1,120	3,343	2,75[illegible]	6,376	1,654	3,011	
Radio Programs Placed	14	101	17	17	14	32	
Posters and Flyers Placed	171	149	42	20	-	127	
Newspaper Releases Placed	4	5	3	18	-	1	

Table 4.- Service Activities Performed in Each of the Northeastern States
During 1973 by Permanent District Agents
(Interviews Classified by Purpose)

State	Total Interviews				Follow-Up Calls			Personal Interviews in Yield Id.
	Prod. of Yield and Qual. Bines Only	Prod. of Yield Qual. Bines Only	Commer. Support Only	Total	Prod. of Yield and Qual. Bines	Prod. of Qual. Bines (Only	General Support Only	Total	
Indiana	7	20	423	3	1	203	251	[illegible]
Maine	32	83	327	15	4	1,171	1,125	[illegible]
Maryland	32[illegible]	71[illegible]	617	218	23	11	72[illegible]	[illegible]
Massachusetts	132	178	413	1,053	110	49	250	[illegible]
New Jersey	-	9	201	210	-	470	470	[illegible]
New York	591	161	454	1,114	182	65	321	1,204	[illegible]
Pennsylvania	1,118	256	2,892	4,268	1,221	192	2,320	3,744	1,024

The Pennsylvania district agents employed 12 Connecticut and Pennsylvania.

Table 5.- Summary, by States, of Informational and Service Activities Performed by Permanent and Temporary Blister Rust Control Agents in the Northeastern States During the Period 1923-1933, Inclusive

Informational

State	Me.	N.H.	Vt.	Mass.	R.I.	Conn.	N.Y.	Totals
Meetings addressed	425	1,833	378	418	155	47	1,031	4,287
Attendance	25,305	113,683	18,182	27,551	13,169	1,940	84,372	284,202
Field dem. meetings	868	753	386	456	22	31	268	2,784
Attendance	4,989	8,493	4,550	3,385	1,243	693	4,674	28,027
Displays placed	904	1,712	535	662	82	117	459	4,471
Publications distributed	65,647	183,416	30,078	149,132	34,421	12,155	132,995	607,844
Mimeo. articles dist. (1928-1933)	4,846	64,432	192	2,433	2,250	91	3,595	77,839
Items published	574	3,526	437	1,998	337	641	2,115	9,628
Posters & signs placed	18,802	19,819	7,506	3,116	2,104	569	9,037	60,953
Roadside dem. placed (1930-1933)	104	32	16	106	3	24	8	293

In addition, during the period July 1 to December 31, 1922, the following general informational work was performed: 251 meetings addressed with an attendance of 29,163 persons, 335 field demonstration meetings attended by 1,732 individuals, 374 displays placed, 35,067 publications distributed, 313 items published and 2,500 posters and signs placed.

Service

State	Me.	N.H.	Vt.	Mass.	R.I.	Conn.	N.Y.	Totals
Initial interviews	27,721	25,764	9,583	29,157	2,777	4,076	20,857	119,935
Follow-up calls	9,272	22,402	6,460	10,439	2,186	3,033	16,332	70,124
Persons instructed in field	19,686	16,124	7,876	11,159	550	1,533	14,005	70,933

During the period July 1 to December 31, 1922, an additional 6,227 initial interviews and 1,924 follow-up calls were made, and 1,540 individuals received personal instruction in the field.

Table 5.- Summary, by States, of Informational and Service Activities Performed by Permanent and Temporary District Court Judges in the Southeastern States During the Period July 1, 1942-June 30, 1943, Inclusive

Informational

	No.	N.Y.	Pa.	Mass.	N.J.	Conn.	N.Y.
Cases disposed	1,254	1,693	778	416	155	147	1,031
Cases	4,305	1,123	1,683	1,181	1,203	1,243	2,172
Cases, motions	845	1,153	765	459	22	31	256
Cases	4,089	3,492	3,230	3,385	1,243	397	4,014
Cases closed	934	1,12	735	682	82	117	459
Actions distributed	45,347	182,415	30,078	149,132	34,421	19,175	132,935
Motions Dist. (1943)	4,845	64,452	142	2,173	2,250	91	3,455
Published	1,114	2,665	437	1,396	337	641	2,112
Items placed	18,802	19,819	7,508	3,118	2,104	564	4,017
Law Dem. placed (1943)	104	72	16	106	3	64	8

In addition, during the period July 1 to December 31, 1942, the following informational work was performed: 251 meetings addressed with an attendance of 7,105 persons. 735 field demonstration meetings attended by 1,752 individuals. Displays placed, 35,067 publications distributed, 313 items published and 2,300 pictures and items placed.

Service

	No.	N.Y.	Vt.	Mass.	N.J.	Conn.	N.Y.
Interviews	27,721	23,104	3,483	29,157	5,117	4,075	20,625
Office calls	9,212	12,402	1,450	10,419	2,156	1,015	10,752
Letters received and mailed	13,686	15,154	1,916	11,157	550	1,333	14,409

During the period July 1 to December 31, 1942, an additional 6,227 interviews and 1,314 follow-up calls were made, and 1,340 individuals received personal instruction in the field.

Table 6.- Summary of Yearly Informational and Service Activities Performed by Permanent and Temporary Blister Rust Control Agents in New England and New York During Period 1923-1933, Inclusive

Informational

Year	Meetings Addressed		Field Dem. Meetings		Displays Placed	Publications Dist.	Mimeo. Articles Dist.	Items Pub.	Posters & Signs Placed	Road. Dem. Placed
	Number	Attendance	Number	Attendance						
1923	722	32,649	834	5,442	582	51,308	-	1,203	6,499	-
1924	707	47,071	792	4,050	647	55,696	-	1,269	9,553	-
1925	627	45,522	418	2,912	680	68,818	-	1,294	8,894	-
1926	490	33,082	210	5,018	624	76,697	-	1,202	8,056	-
1927	467	34,690	148	2,646	647	88,840	-	1,219	7,041	-
1928	363	21,178	159	2,809	492	62,708	14,953	1,109	7,268	-
1929	204	23,729	70	1,898	358	52,332	23,155	769	4,388	-
1930	144	8,275	44	1,022	215	48,124	20,715	518	3,445	127
1931	95	7,852	30	840	109	36,068	9,165	372	2,922	81
1932	233	18,107	38	571	67	39,562	6,416	340	1,758	54
1933	235	12,047	41	819	50	27,691	3,435	333	1,129	31
Totals	4,287	284,202	2,784	28,027	4,471	607,844	77,839	9,628	60,953	293

In addition, during the period July 1 to December 31, 1922, the following general informational work was performed: 251 meetings addressed with an attendance of 29,163 persons, 335 field demonstration meetings attended by 1,732 individuals, 374 displays placed, 35,067 publications distributed, 313 items published and 2,500 posters and signs placed.

Service

Year	Initial Interviews	Follow-Up Calls	Persons Instructed in Field
1923	14,724	5,555	4,274
1924	15,984	6,804	6,198
1925	13,819	7,380	11,169
1926	12,153	7,309	11,559
1927	13,120	8,228	13,102
1928	15,644	8,625	8,952
1929	9,013	6,503	6,741
1930	7,905	5,568	3,166
1931	5,789	5,440	2,070
1932	6,996	4,968	1,884
1933	4,788	3,744	1,818
Totals	119,935	70,124	70,933

During the period July 1 to December 31, 1922, an additional 6,227 initial interviews and 1,924 follow-up calls were made, and 1,540 individuals received personal instruction in the field.

Table 6.- Summary of Yearly Information and Service Activities Performed by Government and Temporary Pilot-to-Pilot Goat Control Experts in Northern New York During Period 1945-1951, Inclusive

Information

Year	Meetings Addressed		Field Demonstrations		Circulars	Publications	News Releases		Farmers Reached	
	Number	Attendance	Number	Attendance	Placed	from Stat.	Articles (6 col.)	Pub.	By Signs	By Word of Mouth
1945	124	32,040	24	5,450	640	21,300	-	2,203	2,429	4,858
1946	107	41,021	192	4,050	847	28,600	-	2,869	3,387	6,774
1947	127	48,592	116	6,012	910	63,126	-	1,234	3,404	6,808
1948	140	35,052	210	5,012	1,014	74,600	-	1,252	3,050	6,100
1949	127	38,500	148	3,345	1,417	23,340	-	1,219	1,321	2,642
1950	121	21,128	159	2,409	1,252	52,100	12,925	1,109	1,560	3,120
1951	204	23,129	10	1,428	1,108	5,372	23,146	139	4,600	9,200
1952	134	8,129	44	1,052	215	42,104	12,716	236	2,446	4,892
1953	90	1,482	30	840	109	30,000	8,108	172	2,822	5,644
1954	71	15,107	34	571	87	35,852	8,413	440	1,728	3,456
1955	134	15,047	41	140	80	27,031	5,945	134	1,123	2,246
Total	1,379	352,149	1,111	30,459	7,899	406,497	71,352	11,673	30,923	61,846

In addition, during the period July 1 to December 31, 1952, the following regular information work was performed: 2,251 meetings addressed with an attendance of 24,192 persons, 335 field demonstration meetings attended by 1,252 individuals, 37% displays placed, 35,057 publications distributed, 312 items published and 2,500 posters and signs placed.

Service

Year	Visited Veterans	Fellow-Up Calls	Persons Instructed in Field
1945	14,124	2,532	4,274
1946	15,354	4,804	5,720
1947	13,514	1,210	11,102
1948	12,124	1,348	11,562
1949	14,120	3,224	13,102
1950	14,344	4,823	8,962
1951	9,012	2,803	6,402
1952	1,908	3,348	7,186
1953	2,120	3,440	8,010
1954	4,254	4,348	4,210
1955	1,783	1,442	1,824
Total	113,[illegible]	10,[illegible]	10,[illegible]

During the period July 1 to December 31, 1952, no additional 5,207 individual observations and 1,954 follow-up calls were made, and 1,340 individuals received personal instruction in the field.

COOPERATION

The informational and service activities have resulted in excellent public participation in blister rust control work, as evidenced by 38,354 individual cooperators expending $463,382.92, and expenditures of $459,815.77 from 1,672 town appropriations during the period 1918 - 1933, inclusive. These individuals actually furnished labor or the equivalent in money to eradicate the Ribes on their properties. Thousands of additional owners permitted the destruction of their cultivated bushes without compensation. In addition to the above direct cooperation, thousands of individuals gave general support and personal aid to the control program.

Individual cooperation in wild Ribes eradication has been solicited in all the Northeastern States. However, such efforts have been restricted in New Hampshire where the work is done chiefly in cooperation with towns, in Maine since 1930 for a similar reason, and in Rhode Island where, except during 1920, state funds have been used to pay the entire cost of the limited amount of necessary control work.

Town cooperation has been obtained chiefly in New Hampshire, Maine, and Connecticut. However, some town funds have also been secured in Vermont and Massachusetts. In New Hampshire, 1,121 town appropriations have made available $354,753.49 for control work. This amount represents 77.2 per cent of the total town money expended in New England since 1918. Many of the New Hampshire towns have consistently made yearly appropriations until their entire pine areas were cleared of Ribes. In fact, initial control work has been completed in 109 New Hampshire towns. The town money in New Hampshire and Connecticut is turned over to the respective states and expended with additional state funds to clear definite town blocks of Ribes, irrespective of property lines.

In Maine, town cooperation has been obtained since 1921; 510 town appropriations making available $89,977.26 for control work. Up to 1931, this town money, except for a few thousand dollars, was used to employ town foremen who aided the individual owners in eradicating Ribes concentrations on their properties. A new state policy was inaugurated in Maine in 1931 whereby the town funds were used to employ crews, as in New Hampshire, and the control areas were systematically worked irrespective of property lines, the state paying one-third of the costs of eradicating the Ribes. The 14 town appropriations, totaling $1,197.91 in Vermont, have been used chiefly to pay the excess labor cost of foremen working with individual owners; but in one instance, a part of the money was spent in eradicating the Ribes on a town forest. Town money was secured in Massachusetts only during 1920 and 1921, when four appropriations, totaling $1,700 were made for control work in Berkshire County.

Individual expenditures for control work have decreased during the depression years since 1929 (Table 8). However, in 1932, during the worst year of the depression, owners actually expended more money on Ribes eradication than during the previous year. There was a decided decrease in the amount of individual cooperation in 1933 primarily due to the fact that such cooperation was not solicited in most of the states after the inauguration of the E.C.W. and N.R.A. programs. Town cooperation, on the other hand, reached high peaks in 1930 and 1931, but during the past two years emergency funds from state and federal sources have necessarily curtailed town cooperation.

CONCLUSION

The information and service activities have resulted in more efficient public action in flood control work, as evidenced by $1,354 individual cooperation during 1948-1952, and expenditures of $429,818.77 from 1,672 town appropriations during the period 1918 - 1933, inclusive. These individuals voluntarily furnished labor or the equivalent in money to appreciate the gifts on their properties. Thousands of additional persons permitted the destruction of their cultivated bushes without compensation. In addition to the above direct cooperation, thousands of individuals gave general support and personal aid to the control program.

Individual cooperation in wild tides eradication has been solicited in all the northeastern States. However, such efforts have been restricted in New Hampshire where the work is done chiefly in cooperation with towns, in Maine since 1930 for a similar reason, and in Rhode Island where, except during 1950, state funds have been used to pay the entire cost of the limited amount of necessary control work.

Town cooperation has been obtained chiefly in New Hampshire, Maine, and Connecticut. However, some town funds have also been secured in Vermont and Massachusetts. In New Hampshire, 1,121 town appropriations have made available $359,739.49 for control work. This amount represents 77.2 per cent of the total town money expended in New England since 1918. Many of the New Hampshire towns have consistently made yearly appropriations until nearly all the marsh tide areas were cleared of tides. In fact, initial control work has been completed in New Hampshire towns. The town money in New Hampshire and Connecticut is turned over to the respective states and expended with additional state funds to clear definite town areas of tides, irrespective of property lines.

In Maine, town cooperation has been obtained since 1921; 310 town appropriations making available $89,977.25 for control work. Up to 1931, this town money, except for a few thousand dollars, was used to employ town foremen who aided the individual owners in eradicating tides on their properties. A new state policy was inaugurated in 1931 whereby the town funds were used to employ crews, as in New Hampshire, and the control areas were systematically worked irrespective of property lines, the state paying one-third of the costs of eradicating the tides. The 14 town appropriations, totaling $1,157.91 in Vermont, have been used chiefly to pay the excess labor cost of foremen working with individual owners; but in one instance, a part of the money was spent in eradicating the tides on a town forest. Town money was secured in Massachusetts only during 1930 and 1931, when four appropriations, totaling $1,500 were made for control work in Barnstable County.

Individual appropriations for control work have decreased during the depression years since 1929 (Table 5). However, in 1932, during the worst year of the depression, owners actually expended more money on tides eradication than during the previous year. There has been a decided decrease in the amount of individual cooperation in 1934 probably due to the fact that such cooperation was not solicited in most of the states after the inauguration of the U.S.A. and W.P.A. programs. Town cooperation, on the other hand, has developed high peaks in 1930 and 1931, but during the past two years emergency funds from state and federal sources have necessarily curtailed town cooperation.

Table 7.- Individual and Town Cooperation in Blister Rust Control Work in Northeastern States

tate	Period	Individual Cooperation			Town Cooperation	
		No. Cooperators		Amount Expended By Individual Cooperators	No. Town Appropriations	Amount Expended
		Cult.Ribes Erad.Only	Wild and Cult.Ribes Erad.			
	1933	-	1	76.83	24	4,888.82
e.	1922-1933	621	10,439	82,060.85	510	89,977.26
	1918-1933	621	10,469	83,223.92	510	89,977.26
	1933	-	4	363.98	30	6,405.22
.H.	1922-1933	-	536	38,904.11	959	329,697.14
	1918-1933	-	678	47,001.67	1,121	354,753.49
	1933	-	93	1,682.59	1*	120.00*
t.	1922-1933	172	2,071	67,188.26	14	1,197.91
	1918-1933	172	2,132	71,209.37	14	1,197.91
	1933	463	493	3,213.29	-	-
ass.	1922-1933	8,426	9,434	80,859.74	-	-
	1918-1933	8,426	9,515	86,843.84	4	1,699.22
	1933	-	-	-	-	-
.I.	1922-1933	-	2	31.36	-	-
	1918-1933	-	8	581.36	-	-
	1933	-	-	-	-	-
onn.	1922-1933	195	288	7,954.29	23	12,187.89
	1918-1933	195	290	8,354.29	23	12,187.89
	1933	-	249	3,511.24	-	-
.Y.	1922-1933	-	5,577	152,775.56	-	-
	1918-1933	-	5,618	164,801.64	-	-
.E.	1933	463	840	8,847.93	55	11,414.04
nd	1922-1933	9,414	28,347	429,774.17	1,506	433,060.20
.Y.	1918-1933	9,414	28,710	462,016.09	1,672	459,815.77
	1933	-	14	96.14	-	-
a.	1922-1933	12	218	1,366.83	-	-
	1918-1933	12	218	1,366.83	-	-
	1933	463	854	8,944.07	55	11,414.04
11	1922-1933	9,426	28,565	431,141.00	1,506	433,060.20
tates	1918-1933	9,426	28,928	463,382.92	1,672	459,815.77

*Expended in connection with N.R.A. control work.

In addition, 5 individuals in New Hampshire expended $42.85 on control work during 1917.

Table 7.- Industrial and Town Cooperation in Silver Rust Control Work in Metropolitan Lima

Period	Industrial Cooperation			Town Cooperation	
	No. Cooperators		Amount Recorded by Industrial Cooperators	No. Town Appropriations	Amount Recorded
	Cont.&Bldrs. Prod. Only	Cont.,Bldrs. and Ind.			
1913	-	1	1,..	1*	4,0..
1914-1923	621	10,479	3..,...,8..	310	2..,3..,..
1924-1933	621	10,469	33,.23,.2.	310	89,3..,..
1934	-	4	..,.8.	30	3,4..,..
1935-1943	-	575	38,.04,.1.	909	429,397,1+
1944-1953	-	67.	1,.01,.7	1.1.1	2..,.83,..
1954	-	21	1,.24,..	1*	180,..
1955-1963	1.1	2,.1.	.1,.8.,..	1+	1,1.7,..
1964-1973	1.1	2,.12	11,.0.,.7	1+	1,1.7,..
1974	4.3	4.3	1,-.3,..	-	-
1964-1973	5,.05	2,.11	40,.8.,.1+	-	-
1915-1923	1,.2.	3,.1.	8..,.1.,.4	1+	1,3.1,.2
1924	-	-	-	-	-
1924-1933	-	2	11,.0.	-	-
1934-1943	-	-	1.2,.1.,.5	-	-
1944-1953	-	3,.18	1..,.01,.4+	-	-
1954	4.2	3,.0	3,.1.,.3	34	11,.1..,..
1955-1963	.,.1.	2..,.3.	1.2,.11.,.7	1,.3..	1.3,.0.,..
1964-1973	3,.1+	28,.10	1.2,.0.,..	1,.12	1.9,.1.,.1.
1974	-	1+	.,.1+	-	-
1964-1973	12	.18	1,.3..,..	-	-
1974	4.3	3.4	3,.4..,..	34	11,.1.,..
1964-1973	3,.45	24,.3.	41,.1..,..	1,.3.	1.3,.0.,..
1915-1973	3,.46	25,.24	1.2,.3.,..	1,.32	1.4,.2.,..

*Expanded in connection with I.R.A. control work.

In addition, 5 individuals in New Kensington expended $42.85 on control work during 1917.

Table 8 .- Individual and Town Cooperation in Blister Rust Control Work in New England and New York, 1918-1933

Year	No. Individual Cooperators		Amount Spent By Individual Cooperators	No. Town Appropri-ations	Amount Appropriated	Amount Expende
	Cult.Ribes Erad. Only	Wild & Cult. Ribes Erad.				
1918	-	19	$ 4,188.63	43	$ 7,200.00	$ 5,029.
1919	-	50	6,645.74	38	6,310.00	7,907.
1920	-	152	8,498.78	51	8,675.00	7,992.
1921	-	142	12,908.77	34	5,550.00	5,827.
1922	-	971	28,035.13	58	20,598.29	18,448.
1923	664	1,968	40,969.47	121	39,530.00	40,150.
1924	1,714	3,050	44,622.07	151	48,429.25	48,898.
1925	958	3,069	39,720.06	132	40,975.00	40,351.
1926	741	3,283	44,254.88	123	40,425.00	41,223.
1927	834	3,537	49,040.81	125	38,127.00	38,299.
1928	991	3,390	54,667.68	143	41,117.00	39,038.
1929	1,016	3,349	49,615.39	156	41,385.23	41,323.
1930	971	2,419	32,999.65	186	48,143.50	46,880.
1931	753	1,090	18,107.09	175	48,399.00	47,455.
1932	309	1,381	18,894.01	81	19,217.09	19,575.
1933	463	840	8,847.93	55*	11,615.10*	11,414.
Totals	9,414	28,710	$462,016.09	1,672	$465,696.46	$459,815.

*Includes expenditure of $120. by one town in Vermont in connection with N.R.A. control

In addition, 5 individuals in New Hampshire expended $42.85 on control work during 1917.

Table 8.- Individual and Town Cooperation in Timber Road Control Acts in New England and Tax Year, 1926-1927

Year	No. Individual Cooperators		Amount Spent By Individual Cooperators	No. Town Apportionments	Amount Apportioned	Amount Expended
	Old Tribes Road.	Mild & Cult. Tribes Trail.				
1913	-	12	$ 4,186.53	43	$ 1,200.00	$ 3,052.11
1919	-	40	6,483.74	73	6,340.00	7,872.31
1920	-	152	8,424.74	71	3,675.00	1,704.09
1921	-	142	15,201.17	74	5,450.00	3,851.05
1922	-	171	24,035.12	76	20,316.89	13,415.89
1923	664	1,214	40,264.47	121	73,330.20	40,142.54
1924	1,144	3,040	44,886.07	123	42,429.57	40,209.40
1925	1,296	3,044	43,720.06	124	40,275.00	40,321.41
1926	1,414	3,283	44,854.88	124	40,425.00	41,475.85
1927	1,444	3,327	40,040.41	125	34,121.47	32,525.74
1928	1,441	3,390	34,867.38	124	41,127.40	40,048.73
1929	1,010	3,449	43,615.39	125	41,365.33	41,323.28
1930	971	2,449	32,370.65	126	40,117.30	40,340.12
1931	1072	1,040	18,107.04	123	40,329.00	41,405.35
1932	1,009	1,341	16,894.01	41	12,141.29	12,340.05
1933	1,042	840	5,412.00	54*	12,015.10*	11,840.14*
Total	9,414	28,712	348,016.09	1,012	348,036.46	348,401.17

*Includes expenditure of $120. by one town in Vermont in connection with T.C.A. control ma

In addition, 5 individuals in New Hampshire expended $42.85 on control work during 1917.

RIBES ERADICATION

Experimental control work in New England and New York during the period 1918 - 1921, inclusive, resulted in 1,042,273 acres being cleared of 15,002,878 wild Ribes and 91,725 cultivated bushes at an average cost of 41 cents per acre. The cost per acre was reduced from 73 cents in 1918 to 24 cents in 1921. In the application of control measures during the present program from 1922 to 1933, inclusive, an additional area of 9,135,269 acres in the Northeastern States was eradicated of 93,842,989 wild and 533,404 cultivated Ribes at a per acre cost of 21.2 cents. This acreage, however, includes 1,150,815 acres reworked since 1922. Therefore, up to 1933, inclusive, control work has been conducted on 9,026,727 acres (pine areas and protection zones) on which 108,845,867 wild and 625,129 cultivated bushes have been destroyed at an average cost of 24 cents per acre. These data include the work performed under the E.C.W. and N.R.A. programs during 1933, and the strictly Federal projects on National Forests and Parks in Maine, New Hampshire and Pennsylvania during the period 1924-1933, inclusive.

Special nursery sanitation work during the years 1930-1933, inclusive, when the data have been kept separate, resulted in an additional 94,247 acres being eradicated of 289,795 wild and 3,648 cultivated bushes. This nursery sanitation work includes 79,493 acres of re-eradication. The special black currant eradication projects in Massachusetts, Rhode Island, Connecticut, and New York resulted in the elimination of an additional 79,709 Ribes nigrum and 20,550 other cultivated Ribes since 1927.

A summary of all work (regular cooperative, E.C.W., N.R.A., Federal projects on National Forests and Parks, nursery sanitation, and special black currant eradication projects) in the Northeastern States from 1918-1933, inclusive, shows that a total of 109,135,662 wild Ribes and 729,036 cultivated bushes have been destroyed. Excluding the special black currant work, 10,271,789 acres have been cleared of Ribes, including 1,230,308 acres of re-eradication work.

For convenience in analyzing the data, Ribes eradication is divided into three main divisions; namely, nursery sanitation, black currant elimination and Ribes eradication other than nursery sanitation and black currant elimination. Each of these divisions is subdivided into three parts; regular cooperative control program, E.C.W. program, and N.R.A. program. The regular cooperative control program is further separated into classes of control work as follows: Individual cooperation, town cooperation, state work on individuals' lands, state work on public lands and federal projects on Government lands. The data are also kept separate under all divisions for initial and re-eradication work.

RIBES ERADICATION OTHER THAN BLACK CURRANT ELIMINATION AND NURSERY SANITATION

REGULAR COOPERATIVE CONTROL PROGRAM

Regular cooperative control work, supervised by the permanent district agents, was conducted during 1933 in all the Northeastern States, particularly during May and June before the C.C. camps were fully organized. The emergency programs necessarily caused a curtailment in the regular cooperative work. However, in spite of this and the economic conditions which had greatly reduced pine values and personal incomes, commendable results were obtained in securing local cooperation. In Maine and New Hampshire, 54 towns expended $11,145.59 on Ribes eradication; while in New York, county expenditures amounted to $694.49. A total

RIBES ERADICATION

Experimental control work in New England and New York during the period 1918 - 1921, inclusive, resulted in 1,042,273 acres being cleared of 15,002,878 wild Ribes and 1,765 cultivated bushes at an average cost of 41 cents per acre. The cost per acre was reduced from 75 cents in 1918 to 24 cents in 1921. In the application of control measures during the present program from 1922 to 1933, inclusive, an additional area of 3,135,289 acres in the Northeastern States was eradicated of 93,842,[illegible] wild and 533,904 cultivated Ribes at a per acre cost of 81.4 cents. This acreage, however, includes 1,150,415 acres reworked since 1922. Therefore, up to 1933, inclusive, control work has been conducted on 3,026,727 acres (pine areas and protection zones) on which 106,845,807 wild and 621,169 cultivated bushes have been destroyed at an average cost of 2+ cents per acre. These data include the work performed under the T.C.C. and N.P.A. programs during 1933, and the strictly federal projects on National Forests and Parks in Maine, New Hampshire and Pennsylvania during the period 1924-1933, inclusive.

Special nursery sanitation work during the years 1930-1933, inclusive, when the data have been kept separate, resulted in an additional 94,547 acres being eradicated of 283,195 wild and 3,648 cultivated bushes. This nursery sanitation work included 79,495 acres of re-eradication. The special black currant eradication projects in Massachusetts, Rhode Island, Connecticut, and New York resulted in the elimination of an additional 79,709 Ribes nigrum and 20,590 other cultivated Ribes since 1927.

A summary of all work (regular cooperative, T.C.C., N.P.A., federal projects on National Forests and Parks, nursery sanitation, and special black currant eradication projects) in the Northeastern States from 1918-1933, inclusive, shows that a total of 109,145,662 wild Ribes and 729,050 cultivated bushes have been destroyed, including the special black currant work, 10,271,739 acres have been cleared of Ribes, including 1,290,308 acres of re-eradication work.

For convenience in analyzing the data, Ribes eradication is divided into three main divisions; namely, nursery sanitation, black currant elimination and Ribes eradication other than nursery sanitation and black currant elimination. Each of these divisions is subdivided into three parts; regular cooperative control program, T.C.C. program, and N.P.A. program. The regular cooperative control program is further separated into classes of control work as follows: Individual cooperation, town cooperation, state work on individuals' lands, state work on public lands and federal projects on Government lands. The data are also kept separate under all divisions for initial and re-eradication work.

RIBES ERADICATION OTHER THAN BLACK CURRANT ELIMINATION AND NURSERY SANITATION

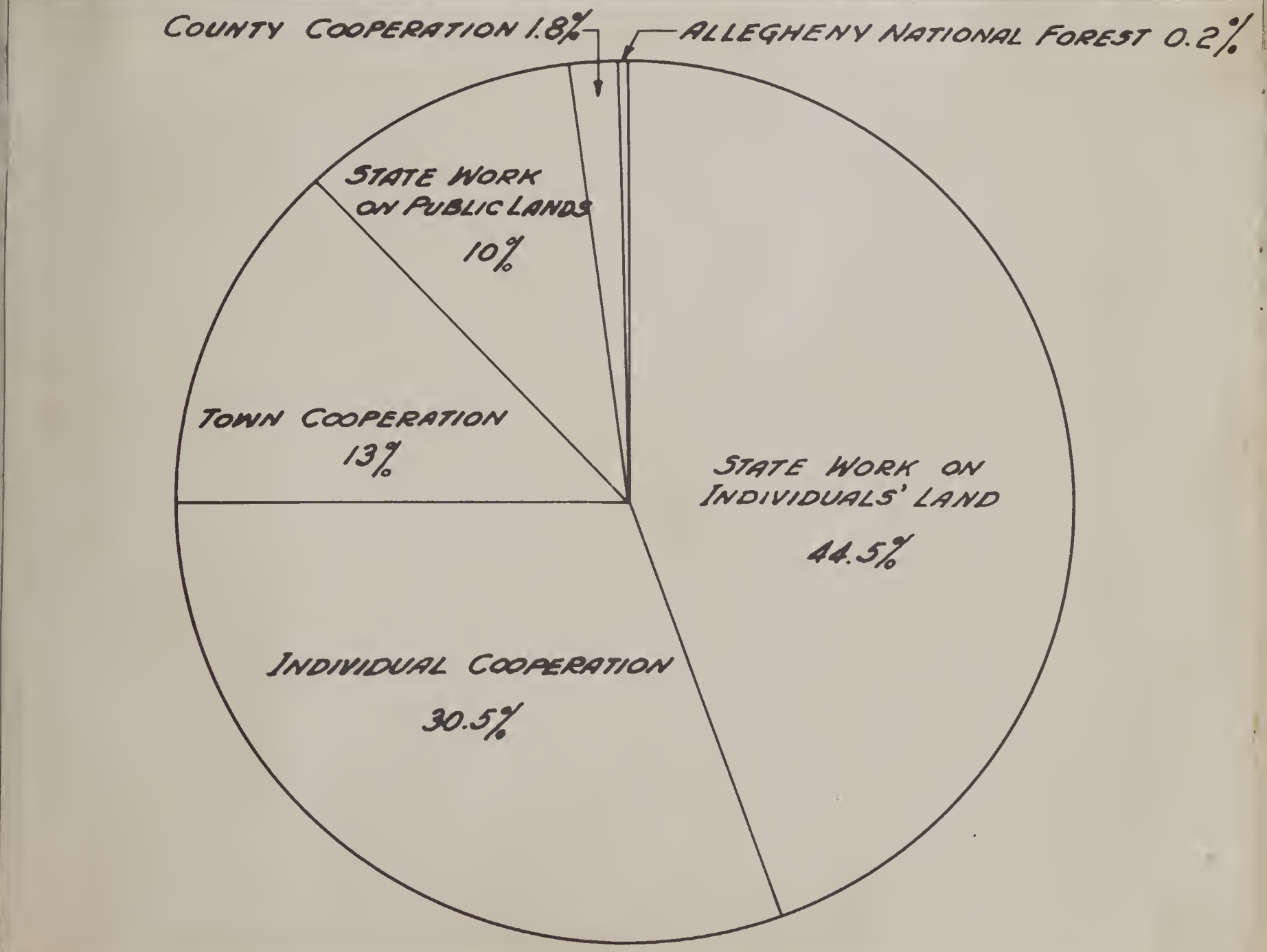
REGULAR COOPERATIVE CONTROL PROGRAM

Regular cooperative control work, supervised by the permanent district agents, was conducted during 1933 in all the Northeastern States, particularly during May and June before the C.C. camps were fully organized. The emergency program necessarily caused a curtailment in the regular cooperative work. However, in spite of this and the economic conditions which greatly reduced pine values and personal incomes, commendable results were obtained in securing local cooperation. In Maine and New Hampshire, 94 towns expended $11,145.59 on Ribes eradication; while in New York, county expenditures amounted to $6,944.49. A total

of 928 individual cooperators spent $8,472.57, and seven of the states expended $52,728.27 in connection with the above listed cooperators and for control work on state lands. Bureau of Plant Industry funds amounting to $999.80 were used to employ scouts in four of the states on areas where the Ribes were too few to require crew work. Also, a part of this Bureau of Plant Industry money represents the cost of a crew foreman on the Allegheny National Forest project. In addition, the Forest Service expended $300.97 on this federal work. Thus, a total of $74,341.79 was spent during 1933 in the Northeastern States on regular cooperative Ribes eradication work. As a result of these expenditures, representing 23,295 man days of work, 283,514 acres were cleared of 3,845,543 wild Ribes and 7,340 cultivated bushes. In other words, on a per acre basis, it cost 26.2 cents to locate and eradicate 13.6 plants. Over 51 percent of this work was re-eradication and a substantial portion of the acreage was examined by scouting methods. The total acreage of this cooperative work represents over 51 percent of the total area (552,855 acres) worked in the Northeastern States during 1933.

Proportion of Total Area Cleared of Ribes Under the Regular Cooperative Control Program in the Northeastern States During 1933 by Classes of Control Work

(Total Area = 283,514 Acres)



of 925 individual cooperators spent $6,472.57, and seven of the states expended $52,728.57 in connection with the above listed cooperators and for control work on state lands. Bureau of Plant Industry funds amounting to $999.80 were used to employ scouts in four of the states as cross where the Zimmes were too few to require crew work. Also, a part of this Bureau of Plant Industry money represents the cost of a crew foreman on the Allegheny National Forest project. In addition, the Forest Service expended $500.00 on this federal work. Thus, a total of $74,351.79 was spent during 1933 in the Northeastern States on regular cooperative Ribes eradication work. As a result of these expenditures, representing 23,098 man days of work, 583,514 acres were cleared of 3,845,043 wild Ribes and 7,340 cultivated bushes. In other words, on a ten acre basis, it cost $6.2 cents to locate and eradicate 13.6 plants. Over 31 percent of this work was re-eradication and a substantial portion of the acreage was examined by scouting methods. The total acreage of this cooperative work represents over 21 percent of the total area (2,752,875 acres) worked in the Northeastern States during 1933.

Apportion of Total Area Cleared of Ribes Under the Regular Cooperative Control Program in the Northeastern States During 1933 by Classes of Control Work

(Total Area = 583,514 Acres)

Table 9.-Ribes Eradication in Cooperation with Individuals in Northeastern States During 1933

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost to				Per Acre	
			Wild	Cult.	Individuals	Gov't.	State	Total	Cost	Ribes
Me.	Initial	105	4,203	9	76.83	-	22.40	99.23	.945	40.0
	Re-Erad.	-	-	-	-	-	-	-	-	-
	Total	105	4,203	9	76.83	-	22.40	99.23	.945	40.0
N.H.	Initial	585	19,179	-	72.50	-	48.00	120.50	.206	32.8
	Re-Erad.	1,565	28,821	5	272.28	-	79.82	352.10	.225	18.4
	Total	2,150	48,000	5	344.78	-	127.82	472.60	.220	22.3
Vt.	Initial	4,823	28,958	195	1,251.74	69.01	65.11	1,385.86	.287	6.0
	Re-Erad.	1,770	3,190	-	426.60	6.00	38.35	470.95	.266	1.8
	Total	6,593	32,148	195	1,678.34	75.01	103.46	1,856.81	.282	4.9
Mass.	Initial	7,750	23,537	48	331.20	40.38	522.15	893.73	.115	3.0
	Re-Erad.	42,203	157,229	1,630	2,509.24	225.25	2,650.10	5,384.59	.128	3.7
	Total	49,953	180,766	1,678	2,840.44	265.63	3,172.25	6,278.32	.126	3.6
N.Y.	Initial	18,973	288,520	967	2,199.07	-	5,271.10	7,470.17	.394	15.2
	Re-Erad.	7,635	39,026	14	1,237.07	-	1,615.84	2,852.91	.374	5.1
	Total	26,608	327,546	981	3,436.14	-	6,886.94	10,323.08	.388	12.3
N.E. and N.Y.	Initial	32,236	364,397	1,219	3,931.34	109.39	5,928.76	9,969.49	.309	11.3
	Re-Erad.	53,173	228,266	1,649	4,445.19	231.25	4,384.11	9,060.55	.170	4.3
	Total	85,409	592,663	2,868	8,376.53	340.64	10,312.87	19,030.04	.223	6.9
Pa.	Initial	1,056	10,751	8	96.14	53.80	-	149.94	.142	10.2
	Re-Erad.	-	-	-	-	-	-	-	-	-
	Total	1,056	10,751	8	96.14	53.80	-	149.94	.142	10.2
All States	Initial	33,292	375,148	1,227	4,027.48	163.19	5,928.76	10,119.43	.304	11.3
	Re-Erad.	53,173	228,266	1,649	4,445.19	231.25	4,384.11	9,060.55	.170	4.3
	Total	86,465	603,414	2,876	8,472.67	394.44	10,312.87	19,179.98	.222	7.0

Table 9.--Class Translation in Cooperation with Individuals in Fort-Wooster Status During 1972

Type of Treatment	Average Yield (Mt.	Value Yield (Mt.	Cost to Individuals	Cost to State	Total	Per Cent
Initial	105	4,203	9	75.2	22.40	97.62
Re-Treat.	-	-	-	-	-	-
Total	105	4,203	9	75.62	22.40	98.02
Initial	525	17,112	-	12.50	108.00	120.50
Re-Treat.	1,565	56,821	5	272.05	79.45	356.50
Total	2,150	86,000	5	284.75	121.85	411.60
Initial	4,823	144,690	145	1,214.74	63.01	1,353.86
Re-Treat.	3,270	117,720	-	116.00	46.35	162.35
Total	8,093	262,410	145	1,330.74	107.36	1,516.21
Initial	1,750	61,250	45	371.25	242.12	613.37
Re-Treat.	1,573	55,029	1,294	2,609.25	225.19	2,834.44
Total	3,323	116,305	1,339	2,980.50	467.31	3,447.81
Initial	16,073	578,628	1,014	2,199.07	1,704.10	3,903.17
Re-Treat.	7,423	267,228	1,014	1,214.07	1,015.32	2,229.39
Total	23,496	845,856	2,028	3,413.14	2,719.42	6,132.56
Initial	29,605	1,065,780	1,059	3,570.57	1,946.52	5,517.09
Re-Treat.	2,038	73,368	1,014	1,214.07	1,015.32	2,229.39
Total	31,643	1,139,148	2,073	4,784.64	2,961.84	7,746.48
Initial	35,215	1,267,740	1,014	3,213.39	2,924.75	6,138.14
Re-Treat.	23,115	832,140	4,446.13	231.45	3,204.11	7,650.55
Total	58,330	2,099,880	5,460.13	3,444.84	6,128.86	13,788.69
Initial	1,950	70,170	8	53.80	64.40	118.20
Re-Treat.	-	-	-	-	-	-
Total	1,950	70,170	8	53.80	64.40	118.20
Initial	33,265	1,197,540	1,221	4,407.48	1,353.86	5,761.34
Re-Treat.	24,865	895,140	1,014	1,214.07	1,015.32	2,229.39
Total	58,130	2,092,680	2,235	5,621.55	2,369.18	7,990.73

Table 10.- Ribes Eradication in Cooperation with Individuals in Northeastern States During Period 1922-1933, Inclusive

(By Years)

ear	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Cost Indiv.	Cost Towns	Cost State	Cost Gov't.	Cost Total	Per Acre Cost	Per Acre Ribes
922	93,828	2,886,282	8,251	$ 28,035.13	$ 820.78	$ 10,770.02	$ -	$ 39,625.93	$ .422	30.8
923	174,875	3,954,508	31,338	40,969.47	6,910.47	16,356.29	-	64,236.23	.367	22.6
924	205,084	4,235,627	37,532	44,622.07	8,000.65	18,263.02	-	70,885.74	.346	20.7
925	209,831	3,567,024	44,811	39,720.06	7,089.87	21,301.74	16.67	68,128.34	.325	17.0
926	241,686	5,485,072	36,075	44,172.88	6,747.56	24,909.27	264.90	76,094.61	.315	22.7
927	291,611	4,993,488	34,066	49,011.06	8,375.41	28,552.54	-	85,939.01	.295	17.1
928	323,218	4,027,921	37,104	54,667.68	8,089.87	30,180.65	315.88	93,254.08	.289	12.5
929	280,366	4,278,373	40,716	49,710.89	7,010.13	35,650.95	100.00	92,471.97	.330	15.3
930	148,532	2,939,888	18,502	31,103.74	6,074.88	20,720.99	536.00	58,435.61	.393	19.8
931	105,078	965,457	4,899	17,660.57	10.50	16,826.06	866.05	35,363.18	.337	9.2
932	159,976	932,054	13,332	18,113.90	529.70	19,580.88	1,021.80	39,246.28	.245	5.8
933	86,465	603,414	2,876	8,472.67	0	10,312.87	394.44	19,179.98	.222	7.0
otals	2,320,550	38869,108	309,502	426,260.12	59,659.82	253,425.28	3,515.74	742,860.96	.320	16.7

(By States)

tate	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Cost Indiv.	Cost Towns	Cost State	Cost Gov't	Cost Total	Per Acre Cost	Per Acre Ribes
Me.	296,001	16,039,328	106,034	80,723.28	58,152.91	368.85	16.67	139,261.71	.470	54.2
N.H.	143,543	3,265,917	9,170	38,731.83	429.00	9,985.66	-	49,146.49	.342	22.8
Vt.	202,290	1,982,375	10,617	67,102.01	1,077.91	9,163.21	1,056.08	78,399.21	.388	9.8
ass.	1,080,838	7,869,996	143,366	78,805.99	-	75,515.13	668.13	154,989.25	.143	7.3
.I.	540	2,175	1,000	31.36	-	94.72	-	126.08	.233	4.0
onn.	56,331	311,977	6,711	6,935.93	-	6,081.73	1,003.86	14,021.52	.249	5.5
.Y.	526,778	9,230,164	28,637	152,562.89	-	152,167.38	15.00	304,745.27	.579	17.5
.E.& .Y.	2,306,321	38,701,932	305,535	424,893.29	59,659.82	253,376.68	2,759.74	740,689.53	.321	16.8
a.	14,229	167,176	3,967	1,366.83	-	48.60	756.00	2,171.43	.153	11.7
ll tates	2,320,550	38,869,108	309,502	426,260.12	59,659.82	253,425.28	3,515.74	742,860.96	.320	16.7

Table 10.- Ribon Production in Connection with Inclusion in Protection Units
During Period 1920-1933, Inclusive

(By Years)

Year	Ribon Pulled		Cost				
	Yield	Pulls	Indiv.	Terms	State	Govt.	Total
1920	1,000	1,000	1.00	1,000.00	-	-	1,000.00
1921	1,200	1,200	1.00	1,200.00	-	-	1,200.00
1922	1,440	1,440	1.00	1,440.00	-	-	1,440.00
1923	1,728	1,728	1.00	1,728.00	-	-	1,728.00
1924	2,074	2,074	1.00	2,074.00	-	-	2,074.00
1925	2,488	2,488	1.00	2,488.00	-	-	2,488.00
1926	2,986	2,986	1.00	2,986.00	-	-	2,986.00
1927	3,583	3,583	1.00	3,583.00	-	-	3,583.00
1928	4,300	4,300	1.00	4,300.00	-	-	4,300.00
1929	5,160	5,160	1.00	5,160.00	-	-	5,160.00
1930	6,192	6,192	1.00	6,192.00	-	-	6,192.00
1931	7,430	7,430	1.00	7,430.00	-	-	7,430.00
1932	8,916	8,916	1.00	8,916.00	-	-	8,916.00
1933	10,699	10,699	1.00	10,699.00	-	-	10,699.00
Total	75,206	75,206	1.00	75,206.00	-	-	75,206.00

(By States)

Year	Ribon Pulled		Cost				
	Yield	Pulls	Indiv.	Terms	State	Govt.	Total
1920	1,000	1,000	1.00	1,000.00	-	-	1,000.00
1921	1,200	1,200	1.00	1,200.00	-	-	1,200.00
1922	1,440	1,440	1.00	1,440.00	-	-	1,440.00
1923	1,728	1,728	1.00	1,728.00	-	-	1,728.00
1924	2,074	2,074	1.00	2,074.00	-	-	2,074.00
1925	2,488	2,488	1.00	2,488.00	-	-	2,488.00
1926	2,986	2,986	1.00	2,986.00	-	-	2,986.00
1927	3,583	3,583	1.00	3,583.00	-	-	3,583.00
1928	4,300	4,300	1.00	4,300.00	-	-	4,300.00
1929	5,160	5,160	1.00	5,160.00	-	-	5,160.00
1930	6,192	6,192	1.00	6,192.00	-	-	6,192.00
1931	7,430	7,430	1.00	7,430.00	-	-	7,430.00
1932	8,916	8,916	1.00	8,916.00	-	-	8,916.00
1933	10,699	10,699	1.00	10,699.00	-	-	10,699.00
Total	75,206	75,206	1.00	75,206.00	-	-	75,206.00

Table 11.-Ribes Eradication in Cooperation with Towns in Northeastern States - 1933*

State	Type of Erad.	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Cost Towns	Cost State	Cost Gov't.	Cost Total	Per Acre Cost	Per Acre Ribes
Me.	Initial	3,878	362,166	685	2,147.60	894.49	87.54	3,129.63	.807	93.4
	Re-Erad.	3,729	236,843	15	2,551.17	763.39	256.59	3,571.15	.958	63.5
	Total	7,607	599,009	700	4,698.77	1,657.88	344.13	6,700.78	.881	78.7
N.H.	Initial	19,580	987,177	34	4,628.82	2,643.27	-	7,272.09	.371	50.4
	Re-Erad.	9,740	236,056	-	1,776.40	1,055.70	-	2,832.10	.291	24.2
	Total	29,320	1,223,233	34	6,405.22	3,698.97	-	10,104.19	.345	41.7
Totals	Initial	23,458	1,349,343	719	6,776.42	3,537.76	87.54	10,401.72	.443	57.5
	Re-Erad.	13,469	472,899	15	4,327.57	1,819.09	256.59	6,403.25	.475	35.1
	Total	36,927	1,822,242	734	11,103.99	5,356.85	344.13	16,804.97	.455	49.3

Table 12.- Ribes Eradication in Cooperation with Towns in Northeastern States During Period 1922-1933*

(By Years)

Years	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Cost Towns	Cost Indiv.	Cost State	Cost Gov't.	Cost Total	Per Acre Cost	Per Acre Ribes
1922	154,641	1,218,793	7,551	16,077.90	-	6,064.96	-	22,142.86	.143	7.9
1923	251,821	3,058,288	20,718	33,240.12	-	14,485.22	-	47,725.34	.190	12.1
1924	326,341	3,991,645	16,071	40,897.85	-	14,878.27	-	55,776.12	.171	12.2
1925	251,669	2,983,216	6,118	33,075.04	-	8,271.20	-	41,346.24	.164	11.8
1926	208,346	2,896,113	3,086	34,476.39	-	10,583.68	-	45,060.07	.216	13.9
1927	22[illegible]576	2,447,492	2,572	29,924.33	-	11,416.16	-	41,340.49	.187	11.1
1928	218,986	1,972,684	6,013	30,948.86	-	8,043.37	-	38,992.23	.178	9.0
1929	260,266	2,236,875	14,987	34,313.15	-	9,399.28	817.55	44,529.98	.171	8.6
1930	241,127	3,027,616	3,799	40,815.24	-	9,604.30	659.17	51,068.71	.212	12.6
1931	190,704	4,064,908	8,995	47,444.86	36.00	16,504.74	-	63,985.60	.336	21.3
1932	61,181	1,903,932	5,310	19,038.53	-	7,252.07	970.83	27,261.43	.446	31.1
1933	36,927	1,822,242	734	11,103.99	-	5,356.85	344.13	16,804.97	.455	49.3
Totals	2,422,585	31,623,804	95,954	371,346.26	36.00	121,860.10	2,791.68	496,034.04	.205	13.1

(By States)

State	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Cost Towns	Cost Indiv.	Cost State	Cost Gov't.	Cost Total	Per Acre Cost	Per Acre Ribes
Me.	52,080	3,035,259	11,016	30,738.17	36.00	9,925.18	344.13	41,043.48	.788	58.3
N.H.	2,279,453	27,352,513	72,718	328,420.20	-	86,323.79	-	414,743.99	.182	12.0
Conn.	91,052	1,236,032	12,220	12,187.89	-	25,611.13	2,447.55	40,246.57	.442	13.6
Totals	2,422,585	31,623,804	95,954	371,346.26	36.00	121,860.10	2,791.68	496,034.04	.205	13.1

*Control work performed by block units irrespective of property lines.

Table 11.- Bibee Eradication in Cooperation with Towns in Northeastern States - 1933*

State	Type of Prod.	Acreage Examined	Bibes Pulled Old.	Bibes Pulled Old.	Costs Towns	Costs State	Costs Gov't.	Costs Total
Ala.	Initial	3,672	382,120	0.3	2,147.60	394.49	2,541.89	2,541.89
	Re-Treat.	3,129	239,243	.6	2,851.17	104.29	2,955.46	2,955.46
	Total	6,801	621,363	100	4,998.77	498.78	5,497.55	5,497.55
Ark.	Initial	14,230	271,110	3	4,023.02	5,847.27	9,870.29	9,870.29
	Re-Treat.	3,140	236,056	-	1,116.40	1,056.70	2,173.10	2,173.10
	Total	24,320	1,253,273	3	5,139.42	6,903.97	12,043.39	12,043.39
Totals	Initial	24,458	1,304,362	1.9	6,172.62	5,672.76	11,845.38	11,845.38
	Re-Treat.	12,409	412,629	1	4,251.52	1,219.09	5,470.61	5,470.61
	Total	36,867	1,688,991	12.4	11,107.94	6,755.85	17,863.79	17,863.79

Table 12.- Bibes Eradication in Cooperation with Towns in Northeastern States During Period 1922-1933*

(By Years)

Years	Acreage Examined	Bibes Pulled Old.	Bibes Pulled Old.	Towns	Costs Indiv.	Costs State	Costs Gov't.	Costs Total
1922	154,615	1,816,795	1,331	16,077.90	-	6,084.05	-	22,161.95
1923	251,821	4,058,288	20,718	34,540.15	-	14,465.22	-	49,005.37
1924	326,341	3,991,645	16,071	40,837.35	-	14,612.21	-	55,449.56
1925	251,669	3,953,216	8,118	33,072.04	-	8,271.20	-	41,343.24
1926	208,245	3,236,872	14,987	24,343.15	-	9,799.28	817.55	34,959.98
1927	241,427	3,027,816	3,799	40,814.24	-	3,004.30	659.17	44,477.71
1931	190,704	4,054,908	6,995	47,444.86	36.00	15,804.74	-	63,285.60
1932	61,181	1,905,232	5,310	19,038.33	-	7,252.07	970.83	27,261.43
1933	76,251	1,852,234	134	11,103.99	-	5,335.65	394.17	16,833.81
Total	2,422,582	31,054,804	95,944	371,345.26	36.00	121,866.10	5,191.08	498,438.44

(By States)

State	Acreage Examined	Bibes Pulled Old.	Towns	Indiv.	State	Gov't.	Total	Com.
Ala.	36,867	1,688,991	12.4	11,107.94	6,755.85	394.17	17,863.79	17,863.79
Ark.	24,458	1,304,362	1.9	6,172.62	5,672.76	394.17	11,845.38	11,845.38
Totals	61,325	2,993,353	14.3	17,280.56	12,428.61	788.34	29,709.17	29,709.17

*Control work performed by block units irrespective of property lines.

Table 13.-State Work on Individuals' Lands in Northeastern States - 1933
(Regular Cooperative Program)

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost				Per Acre	
			Wild	Cult.	State	Towns	Gov't.	Total	Cost	Ribes
Me.	Initial	6,086	1,581	-	34.60	17.20	38.89	90.69	.015	0.25
	Re-Erad.	11,995	451	-	67.00	24.40	39.63	131.03	.011	0.04
	Total	18,081	2,032	-	101.60	41.60	78.52	221.72	.012	0.1
N.H.	Initial	22,285	656,611	345	10,365.53	-	-	10,365.53	.465	29.5
	Re-Erad.	2,145	16,020	-	558.28	-	-	558.28	.260	7.5
	Total	24,430	672,631	345	10,923.81	-	-	10,923.81	.447	27.5
Vt.	Initial	190	295	-	-	-	17.63	17.63	.093	1.6
	Re-Erad.	-	-	-	-	-	-	-	-	-
	Total	190	295	-	-	-	17.63	17.63	.093	1.6
Mass.	Initial	-	-	-	-	-	-	-	-	-
	Re-Erad.	29,840	70,913	742	2,661.13	-	104.12	2,765.25	.093	2.4
	Total	29,840	70,913	742	2,661.13	-	104.12	2,765.25	.093	2.4
Conn.	Initial	-	-	-	-	-	-	-	-	-
	Re-Erad.	1,014	11,785	-	696.90	-	-	696.90	.687	11.6
	Total	1,014	11,785	-	696.90	-	-	696.90	.687	11.6
N.Y.	Initial	39,964	141,171	1,049	7,640.84	-	-	7,640.84	.191	3.5
	Re-Erad.	12,159	21,576	65	2,050.45	-	-	2,050.45	.169	1.8
	Total	52,123	162,747	1,114	9,691.29	-	-	9,691.29	.186	3.1
N.E. and N.Y.	Initial	68,525	799,658	1,394	18,040.97	17.20	56.52	18,114.69	.264	11.7
	Re-Erad.	57,153	120,745	807	6,033.76	24.40	143.75	6,201.91	.109	2.1
	Total	125,678	920,403	2,201	24,074.73	41.60	200.27	24,316.60	.193	7.3
Pa.	Initial	564	138	-	-	-	10.00	10.00	.018	0.2
	Re-Erad.	-	-	-	-	-	-	-	-	-
	Total	564	138	-	-	-	10.00	10.00	.018	0.2
All States	Initial	69,089	799,796	1,394	18,040.97	17.20	66.52	18,124.69	.262	11.6
	Re-Erad.	57,153	120,745	807	6,033.76	24.40	143.75	6,201.91	.109	2.1
	Total	126,242	920,541	2,201	24,074.73	41.60	210.27	24,326.60	.193	7.3

Table 14.- State Work on Individuals' Lands in Northeastern States, 1922-1933

(By Years)

Year	Acreage Examined	Ribes Pulled		Cost					Per Acre	
		Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
1922	218,736	294,023	259	-	-	5,178.51	3,200.90	8,379.41	.038	1.3
1923	457,209	233,169	2,999	-	-	12,032.26	2,812.53	14,844.79	.032	0.51
1924	460,739	131,233	20,143	-	-	12,076.07	3,972.39	16,048.46	.035	0.28
1925	366,763	476,012	8,440	-	186.40	17,031.02	2,152.56	19,369.98	.053	1.3
1926	346,010	106,194	11,620	-	-	11,257.44	2,428.90	13,686.34	.040	0.31
1927	373,341	130,643	9,726	29.75	-	12,599.20	3,409.71	16,038.66	.043	0.35
1928	322,417	79,008	13,104	-	-	15,668.93	2,678.39	18,347.32	.057	0.25
1929	344,742	126,144	15,520	74.50	-	14,291.70	1,776.56	16,142.76	.047	0.37
1930	279,070	137,006	6,602	26.50	-	11,487.10	2,285.25	13,798.85	.049	0.49
1931	229,676	190,441	5,802	50.00	-	14,266.98	1,665.46	15,982.44	.070	0.83
1932	277,538	427,123	5,123	-	-	26,344.31	2,599.71	28,944.02	.104	1.5
1933	126,242	920,541	2,201	-	41.60	24,074.73	210.27	24,326.60	.193	7.3
Totals	3,802,483	3,251,537	101,539	180.75	228.00	176,308.25	29,192.63	205,909.63	.054	0.85

(By State)

States	Acreage Examined	Ribes Pulled		Cost					Per Acre	
		Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
Me.	2,272,409	214,182	1,170	-	228.00	14,239.88	23,174.70	37,642.58	.017	0.1
N.H.	79,072	714,509	345	-	-	16,658.83	-	16,658.83	.211	9.0
Vt.	190	295	-	-	-	-	17.63	17.63	.093	1.6
Mass.	957,137	1,284,060	83,223	-	-	88,083.52	549.12	88,632.64	.093	1.3
R.I.	185,157	110,832	7,035	-	-	13,355.00	1,822.16	15,177.16	.082	0.59
Conn.	96,777	316,798	3,272	180.75	-	7,988.34	3,290.02	11,459.11	.118	3.3
N. Y.	194,274	606,215	5,944	-	-	35,976.48	-	35,976.48	.185	3.1
N.E.& N.Y.	3,785,016	3,246,891	100,989	180.75	228.00	176,302.05	28,853.63	205,564.43	.054	0.85
Pa.	17,467	4,646	550	-	-	6.20	339.00	345.20	.020	0.3
All States	3,802,483	3,251,537	101,539	180.75	228.00	176,308.25	29,192.63	205,909.63	.054	0.85

Table IV.- State Tax on Individual Income in Northeastern States, 1932-1933

(By Years)

Year	Number of Returns	Taxable Income	Tax	Average Tax per Return	Average Tax per $100 of Income
1932	1,234,567	$1,234,567,890	$12,345,678	$10.00	$1.00
1933	1,345,678	$1,456,789,012	$14,567,890	$10.83	$1.00

(By States)

State	Number of Returns	Taxable Income	Tax	Average Tax per Return	Average Tax per $100 of Income
Alpha	456,789	$567,890,123	$5,678,901	$12.43	$1.00
Beta	345,678	$456,789,012	$4,567,890	$13.21	$1.00
Gamma	432,100	$432,100,987	$4,321,009	$10.00	$1.00

Table 15.-
Ribes Eradication on Public Lands (Excluding Federal Projects) in Northeastern States - 1933

(Regular Cooperative Program)

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost			Per Acre	
			Wild	Cult.	State	Counties	Total	Cost	Ribes
N.H.	Initial	546	12,033	-	72.18	-	72.18	.132	22.0
	Re-Erad.	-	-	-	-	-	-	-	-
	Total	546	12,033	-	72.18	-	72.18	.132	22.0
Mass.	Initial	-	-	-	-	-	-	-	-
	Re-Erad.	2,187	932	400	417.87	-	417.87	.191	0.4
	Total	2,187	932	400	417.87	-	417.87	.191	0.4
N.Y.	Initial	11,509	103,586	1,027	3,362.13	694.49	4,056.62	.352	9.0
	Re-Erad.	16,171	121,953	91	6,367.72	-	6,367.72	.394	7.5
	Total	27,680	225,539	1,118	9,729.85	694.49	10,424.34	.377	8.15
N.E. and N.Y.	Initial	12,055	115,619	1,027	3,434.31	694.49	4,128.80	.343	9.59
	Re-Erad.	18,358	122,885	491	6,785.59	-	6,785.59	.370	6.69
	Total	30,413	238,504	1,518	10,219.90	694.49	10,914.39	.359	7.84
Pa.	Initial	198	135,818	-	522.00	-	522.00	2.64	685.9
	Re-Erad.	2,808	93,455	11	2,241.92	-	2,241.92	.798	33.3
	Total	3,006	229,273	11	2,763.92	-	2,763.92	.919	76.3
All States	Initial	12,253	251,437	1,027	3,956.31	694.49	4,650.80	.380	20.5
	Re-Erad.	21,166	216,340	502	9,027.51	-	9,027.51	.427	10.2
	Total	33,419	467,777	1,529	12,983.82	694.49	13,678.31	.409	14.0

Table 15.-

Fibre Production on Public Lands (Territory Federal Projects) in Specified Sta

(Decimal Comparative Pictorial)

Type of	Acreage		Fibre Initial		Cost	
Prod.	Harvested	Yield	Cost.	State	Counties	Total
Initial	546	12,053	-	72.18	-	72.46
Re-Prod.	-	-	-	-	-	-
Total	546	12,053	-	72.18	-	72.46
Initial	-	-	-	-	-	-
Re-Prod.	6,127	945	5,740	417.37	-	417.37
Total	6,127	945	5,740	417.37	-	417.37
Initial	17,409	103,365	1,052	5,264.82	4,449	4,049.82
Re-Prod.	10,172	181,353	34	5,341.72	-	5,341.72
Total	27,580	284,718	1,114	5,264.54	4,449	10,491.54
Initial	17,048	119,019	1,027	3,444.33	1,449	4,893.33
Re-Prod.	14,524	129,334	444	5,185.49	-	5,185.49
Total	30,412	248,504	1,413	10,249.82	1,449	10,078.82
Initial	1,348	175,311	-	765.00	-	765.00
Re-Prod.	5,308	22,453	11	2,241.92	-	2,241.92
Total	3,005	254,515	11	2,193.92	-	2,193.92
Initial	15,253	251,437	1,027	3,536.31	1,449	4,985.31
Re-Prod.	21,164	216,340	502	5,021.51	-	5,021.51
Total	43,419	467,777	1,529	12,253.82	1,449	13,706.82

Table 16.-Ribes Eradication on Public Lands (Excluding Federal Lands) In Northeastern States During Period 1922-1933, Inclusive - By Years

(Regular Cooperative Program)

Years	Acreage Examined	Ribes Pulled		Cost				Per Acre	
		Wild	Cult.	State	Gov't.	Counties	Total	Cost	Ribes
1922	8,012	450,714	-	$26,670.45	-	-	$26,670.45	3.33	56.3
1923	8,734	723,952	119	34,077.51	-	-	34,077.51	3.90	82.9
1924	15,878	1,107,766	112	26,465.20	-	-	26,465.20	1.67	69.8
1925	6,165	270,418	89	9,647.30	-	-	9,647.30	1.56	43.9
1926	18,397	350,621	690	13,541.89	-	-	13,541.89	.736	19.1
1927	14,098	463,853	3,381	12,197.66	-	-	12,197.66	.865	32.9
1928	19,091	600,388	4,340	10,436.52	317.25	-	10,753.77	.563	31.4
1929	45,804	928,105	5,219	23,630.73	-	833.90	24,464.63	.534	20.3
1930	40,738	1,841,654	2,059	30,458.26	125.00	1,112.10	31,695.36	.778	45.2
1931	50,077	1,824,676	2,282	38,208.10	-	2,699.92	40,908.02	.817	36.4
1932	43,874	1,327,890	1,326	25,270.96	131.81	1,252.88	26,655.65	.608	30.3
1933	33,419	467,777	1,529	12,983.82	-	694.49	13,678.31	.409	14.0
Totals	304,287	10,357,814	21,046	263,588.40	574.06	6,593.29	270,755.75	.890	34.0

By States

State	Acreage Examined	Ribes Pulled						Per Acre	
		Wild	Cult.	State	Gov't.	Counties	Total	Cost	Ribes
N.H.	5,926	289,840	609	2,750.16	-	-	2,750.16	.464	48.9
Vt.	4,068	41,276	220	2,117.96	-	-	2,117.96	.521	10.1
Mass.	75,497	2,212,449	9,147	29,448.23	62.50	-	29,510.73	.391	29.3
R.I.	1,106	6,226	70	162.92	10.64	-	173.56	.157	5.6
Conn.	6,257	17,528	71	774.14	500.92	-	1,275.06	.204	2.8
N.Y.	174,292	5,125,732	9,959	197,238.05	-	6,593.29	203,831.34	1.17	29.4
N.E.& N.Y.	267,146	7,693,051	20,076	232,491.46	574.06	6,593.29	239,658.81	.897	28.8
Pa.	37,141	2,664,763	970	31,096.94	-	-	31,096.94	.837	71.7
All States	304,287	10,357,814	21,046	263,588.40	574.06	6,593.29	270,755.75	.890	34.0

Table IV.--Rides Tabulation on Public Lands (Including Federal Roads)
In Northeastern States During Period 1952-1973, Inclusive - By Years

(Regular Cooperative Program)

	Miles Paved		Cost			
Year	Total	Added	State	Counties	Federal	Total
1952	6,012	340	-	-	120,810	120,810
1953	6,124	112	2,240	-	34,020	36,260
1954	15,342	1,218	24,360	-	243,600	267,960
1955	16,890	1,548	30,960	-	309,600	340,560
1956	18,240	1,350	27,000	-	270,000	297,000
1957	19,042	802	16,040	-	160,400	176,440
1958	20,000	958	19,160	-	191,600	210,760
1959	20,842	842	16,840	-	168,400	185,240
1960	21,758	916	18,320	1,832	183,200	203,352
1961	22,617	859	17,180	1,718	171,800	190,698
1962	23,407	790	15,800	1,580	158,000	175,380
1963	24,124	717	14,340	1,434	143,400	159,174
1964	24,768	644	12,880	1,288	128,800	142,968
1965	25,342	574	11,480	1,148	114,800	127,428
1966	25,842	500	10,000	1,000	100,000	111,000
1967	26,268	426	8,520	852	85,200	94,572
1968	26,618	350	7,000	700	70,000	77,700
1969	26,892	274	5,480	548	54,800	60,828
1970	27,090	198	3,960	396	39,600	43,956
1971	27,212	122	2,440	244	24,400	27,084
1972	27,300	88	1,760	176	17,600	19,536
1973	27,360	60	1,200	120	12,000	13,320
Total		13,360	267,200	13,360	2,672,000	2,952,560

By States

Federal Projects on Government Lands

Control measures are being applied as rapidly as funds permit on the white pine areas in the National Forests and Parks in the Northeastern States that are of sufficient value to justify the cost of protection. Such work has been conducted as a strictly federal project, the Bureau of Plant Industry cooperating with the National Park and Forest Services. The project at Acadia National Park in Maine was begun in 1929, and has been continued each succeeding year. All the 1933 control work on this Park was performed by C.C.C. personnel, and the data are included in the summaries of control work under the E.C.W. program. The initial control work is practically completed on all present Acadia Park areas. It is expected that C.C.C. crews will be used during 1934 to complete all the remaining initial control work on Mount Desert Island (mostly potential Park areas) and that the 1929 areas will be re-examined.

All of the white pine areas worth protecting on the White Mountain National Forest were initially cleared of Ribes during the period 1924-1931, inclusive. During 1933, C.C.C. crews were used to rework some of the more important areas and initial control was established on a portion of the new experimental tract at Bethlehem. The remainder of this area will be covered during 1934 and the re-eradication work will be completed in the Swift River Valley.

The Hearts Content area on the Allegheny National Forest in Pennsylvania was initially cleared of Ribes in 1929. The entire control area of 461 acres was re-examined in 1931 and the most likely Ribes sites totalling 166 acres were reworked again in 1933. During 1932, an area of 135 acres on the Hazelwood Oil Company tract was cleared of Ribes to protect a valuable stand of white pine comprising approximately 40 acres. The Kelly Pines and Sand Stone Springs Camp sites were initially cleared of Ribes during 1933.

Table 17.- Summary of Ribes Eradication Work on Federal Lands in Connection with Regular Cooperative Program

1933

Project	Type of Work	Acreage Examined	Ribes Pulled		Man.Hrs. Erad. Ribes	Cost			Per Acre	
			Wild	Cult.		Forest Service	B.P.I.	Total	Cost	Ribes
Allegheny National Forest	Initial	295	24,897	-	566	$197.61	$24.36	$221.97	.752	84.4
	Re-Erad.	166	6,672	-	351⅓	103.36	26.60	129.96	.783	40.2
	Total	461	31,569	-	917⅓	$300.97	$50.96	$351.93	.763	68.5

The B.P.I. expenditures represent the cost of Hodgkins' time while acting as a crew foreman at the rate of $4.48 per day.

1924-1933, Inclusive

Project	Type of Work	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	B.P.I.	State	Forest Service	Park Service	Total	Cost	Ribes
Acadia National Park,Me.	All Initial	7,726	503,920	-	$3145.83	-	-	$8345.53	$11,491.36	1.49	65.2
White Mt. National Forest,NH	All Initial	6,779	182,493	-	75.63	224.11	1471.62	-	1,771.36	.261	26.9
Allegheny National Forest,Pa.	Initial	891	129,019	8	136.56	-	507.71	-	644.27	.723	144.8
	Re-Erad.	627	19,993	-	71.29	-	272.06	-	343.35	.548	31.9
	Total	1,518	149,012	8	207.85	-	779.77	-	987.62	.651	98.2
Totals	Initial	15,396	815,432	8	3358.02	224.11	1979.33	8345.53	13,906.99	.903	53.0
	Re-Erad.	627	19,993	-	71.29	-	272.06	-	343.35	.548	31.9
	Total	16,023	835,425	8	$3429.31	$224.11	$2251.39	$8345.53	$14,250.34	.889	52.1

The control work performed on federal lands by the CCC crews from the Acadia National Park and White Mt. National Forest is summarized in Table 25. The E.C.W. work is not included in Table 17.

Federal Projects in Government Lands

Crated sculptures are being supplied as regularly as stone permit on the white glue areas in the National Forests and Parks in the Northwestern States and are of sufficient value to justify the cost of protection. Such work has been conducted in strictly federal projects, like Bureau of Plant Industry cooperation with the National Park and Forest Services. The project at Acadia National Park in Maine was begun in 1913, and has been continued each succeeding year. All the 1927 contract work on this Park was performed by C.C.C. personnel, and the data are included in the summaries of contract work under the F.W.A. program. The initial contract work is practically completed on all present Acadia Park areas. It is expected that C.C.C. crews will be used during 1934 to complete all the remaining initial contract work on local Department lands. Hardly potential fuel reserves and that the 1933 areas will be re-examined.

All of the white pine areas worthy protection on the Mills Mountain National Forest were initially cleared of slash during the period 1926-1931, inclusive. During 1933, C.C.C. crews were used to thereon Park of the more thorough piece and initial cooperation was undertaken on a portion of the ten experimental tracts at Natural Bridge. The remainder of this area will be covered during 1934 and the re-examination work will be completed in the Night Hawk Valley.

The Santa Rosita area on the Allegheny National Forest is practically clear of slash in 1933. The entire control area of 561 acres was re-examined in 1931 and the most likely slash existing 765 acres were treated which in 1933. During 1932, an area of 375 acres on the Lumberwood Oil Company tract was cleared of Slash to protect a valuable stand of white pine containing approximately 40 acres. The Kelly Pines and Sand Stone Springs Camp sites were initially cleared of slash during 1932.

Table 17.- Summary of Slash Reduction Work on Federal Lands in Connection with Forest Insect Control Projects, 1926-1933

1933

Project	Type of Work	Area Treated	Slash Reduced	Time Required			
				S.F.L.	State	Service	Total
National Park	All	7,756	-	2,156	-	-	2,156
Allegheny Nat. For.	Partial	1,772	-	72.0	2,044	-	2,772
Shenandoah Nat. Park	Partial	1,772	-	72.0	2,044	-	2,772
Total		11,300	-	2,300	2,044	-	4,344

The S.F.L. expenditures represent the cost of Emergency Slash Reduction Labor at the rate of $4.00 per day.

Table 18.-
Summary of Total** Ribes Eradication Work Under Regular Cooperative Program in Northeastern States - 1933

(Initial and Re-Eradication)

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
	Initial	10,069	367,950	694	76.83	2,164.80	951.49	126.43	3,319.55	.330	36.5
Me.	Re-Erad.	15,724	237,294	15	-	2,575.57	830.39	296.22	3,702.18	.235	15.1
	Total	25,793	605,244	709	76.83	4,740.37	1,781.88	422.65	7,021.73	.272	23.5
	Initial	42,996	1,675,000	379	72.50	4,628.82	13,128.98	-	17,830.30	.415	39.0
N.H.	Re-Erad.	13,450	280,897	5	272.28	1,776.40	1,693.80	-	3,742.48	.278	20.9
	Total	56,446	1,955,897	384	344.78	6,405.22	14,822.78	-	21,572.78	.382	34.7
	Initial	5,013	29,253	195	1,251.74	-	65.11	86.64	1,403.49	.280	5.8
Vt.	Re-Erad.	1,770	3,190	-	426.60	-	38.35	6.00	470.95	.266	1.8
	Total	6,783	32,443	195	1,678.34	-	103.46	92.64	1,874.44	.276	4.8
	Initial	7,750	23,537	48	331.20	-	522.15	40.38	893.73	.115	3.0
Mass.	Re-Erad.	74,230	229,074	2,772	2,509.24	-	5,729.10	329.37	8,567.71	.115	3.1
	Total	81,980	252,611	2,820	2,840.44	-	6,251.25	369.75	9,461.44	.115	3.1
	Initial	-	-	-	-	-	-	-	-	-	-
Conn.	Re-Erad.	1,014	11,785	-	-	-	696.90	-	696.90	.687	11.6
	Total	1,014	11,785	-	-	-	696.90	-	696.90	.687	11.6
	Initial	70,446	533,277	3,043	2,199.07	694.49*	16,274.07	-	19,167.63	.272	7.6
N.Y.	Re-Erad.	35,965	182,555	170	1,237.07	-	10,034.01	-	11,271.08	.313	5.1
	Total	106,411	715,832	3,213	3,436.14	694.49*	26,308.08	-	30,438.71	.286	6.7
N.F.	Initial	136,274	2,629,017	4,359	3,931.34	694.49* 6,793.62	30,941.80	253.45	42,614.70	.313	19.3
and	Re-Erad.	142,153	944,795	2,962	4,445.19	4,351.97	19,022.55	631.59	28,451.30	.200	6.7
N.Y.	Total	278,427	3,573,812	7,321	8,376.53	11,145.59	49,964.35	885.04	71,066.00	.255	12.8
	Initial	1,818	146,707	8	96.14	-	522.00	63.80	681.94	.375	80.7
Pa.	Re-Erad.	2,808	93,455	11	-	-	2,241.92	-	2,241.92	.789	33.3
	Total	4,626	240,162	19	96.14	-	2,763.92	63.80	2,923.86	.632	51.9
	Initial	138,092	2,775,724	4,367	4,027.48	694.49* 6,793.62	31,463.80	317.25	43,296.64	.314	20.1
All	Re-Erad.	144,961	1,038,250	2,973	4,445.19	4,351.97	21,264.47	631.59	30,693.22	.212	7.2
States	Total	283,053	3,813,974	7,340	8,472.67	694.49* 11,145.59	52,728.27	948.84	73,989.86	.261	13.5

*Expenditures by counties.

**In addition, 461 acres on the Allegheny National Forest were cleared of 31,569 wild Ribes at a cost of $300.97 to the Forest Service and $50.96 to the Bureau of Plant Industry.

Table 13.-

Summary of Total Tube Production for Under Regular Cooperative Program in Northwestern States - 1932

(Initial and Re-Inspection)

Type of Tube	Acreage Signed	Tubes Tested					
		Old	Initial	Total	Positive	Negative	Per Cent Positive
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Initial	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Re-Test	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000

*Represents tubes by counties.

**In addition, 1931 acres on the Delayed Initial Tested were planted of 21,000 added tubes at a cost of $300.00 to the Tested Portions and $50.00 to the Bureau of Plant Industry.

Table 19.- Summary of Total Ribes Eradication Work in Northeastern States Under Regular Cooperative Program - 1922-1933, Inclusive

Initial and Re-Eradication

By Years

Year	Acreage Examined	Ribes Pulled		Cost						Per Acre	
		Wild	Cult.	Indiv.	Towns	State	Gov't.	Counties	Total	Cost	Ribes
1922	475,217	4,849,812	16,061	28,035.13	16,898.68	48,683.94	3,200.90	-	96,818.65	.204	10.2
1923	892,639	7,969,917	55,074	40,969.47	40,150.59	76,951.28	2,812.53	-	160,883.87	.180	8.9
1924	1,012,986	9,527,787	73,858	44,622.07	48,898.50	71,804.15	4,603.18	-	169,927.90	.168	9.4
1925	834,894	7,346,289	59,458	39,720.06	40,351.31	56,251.26	2,479.86	-	138,802.49	.166	8.8
1926	815,187	8,858,071	51,471	44,172.88	41,223.95	60,304.66	2,836.34	-	148,537.83	.182	10.9
1927	899,852	8,046,826	49,745	49,040.81	38,299.74	64,765.56	3,512.44	-	155,618.55	.173	8.9
1928	883,712	6,680,001	60,561	54,667.68	39,038.73	64,329.47	3,311.52	-	161,347.40	.183	7.6
1929	932,787	7,666,890	76,450	49,785.39	41,323.28	82,972.66	4,127.81	833.90	179,043.04	.192	8.2
1930	712,229	8,186,105	30,962	31,130.24	46,880.12	72,270.65	8,272.84	1,112.10	159,665.95	.224	11.5
1931	578,291	7,174,121	21,978	17,746.57	47,455.36	85,896.02	6,041.97	2,699.92	159,839.84	.276	12.4
1932	544,620	4,786,326	25,091	18,113.90	19,568.23	78,448.22	7,600.18	1,252.88	124,983.41	.229	8.8
1933	283,514	3,845,543	7,340	8,472.67	11,145.59	52,728.27	1,300.77	694.49	74,341.79	.262	13.6
Totals	8,865,928	84,937,688	528,049	426,476.87	431,234.08	815,406.14	50,100.34	6,593.29	1,729,810.72	.195	9.6

By States

State	Acreage Examined	Ribes Pulled		Cost						Per Acre	
		Wild	Cult.	Indiv.	Towns	State	Gov't.	Counties	Total	Cost	Ribes
Me.	2,628,216	19,792,689	118,220	80,759.28	89,119.08	24,533.91	35,026.86	-	229,439.13	.087	7.5
N.H.	2,514,773	31,805,272	82,842	38,731.83	328,849.20	115,942.55	1,547.25	-	485,070.83	.193	12.6
Vt.	206,548	2,023,946	10,837	67,102.01	1,077.91	11,281.17	1,073.71	-	80,534.80	.390	9.8
Mass.	2,113,472	11,366,505	235,736	78,805.99	-	193,046.88	1,279.75	-	273,132.62	.129	5.4
R.I.	186,803	119,233	8,105	31.36	-	13,612.64	1,832.80	-	15,476.80	.083	0.6
Conn.	250,417	1,882,335	22,274	7,116.68	12,187.89	40,455.34	7,242.35	-	67,002.26	.268	7.5
N.Y.	895,344	14,962,111	44,540	152,562.89	-	385,381.91	15.00	6,593.29	544,553.09	.608	16.7
N.E.&NY	8,795,573	81,952,091	522,554	425,110.04	431,234.08	784,254.40	48,017.72	6,593.29	1,695,209.53	.193	9.3
Pa.	70,355	2,985,597	5,495	1,366.83	-	31,151.74	2,082.62	-	34,601.19	.492	42.4
Totals	8,865,928	84,937,688	528,049	426,476.87	431,234.08	815,406.14	50,100.34	6,593.29	1,729,810.72	.195	9.6

Table 19.- Summary of Total Tribe Predications Year by Year Between States Under Regular Cooperative Program - 1926-1977, Inclusive

Initial and Re-Predication

By Years

Year	Increase Terminated	Tribes Initial Held	Tribes Initial Omit.	Cost Train.	Cost Farms	Cost State	Cost For't.	Cost Counties	Total
1926	72	4,419	16,061	28,275.12	16,902.65	4,434.04	200.00	-	49,811.81
1927	292	7,969	55,014	40,949.47	40,140.59	26,731.98	2,812.54	-	110,634.58
1928	212	9,721	72,487	48,656.07	48,856.50	32,804.32	4,402.19	-	134,719.08
1929	328	7,715	58,429	40,000.00	40,321.33	26,851.60	4,179.83	-	111,352.76
1930	575	8,852	51,171	44,172.68	40,204.04	30,044.56	5,876.71	-	120,297.99
1931	696	8,946	36,426	46,000.00	36,576.46	31,284.84	6,512.84	-	120,374.14
1932	1,717	5,680	16,440	29,000.00	22,000.00	20,000.00	4,000.00	-	75,000.00
1933	1,274	7,455	15,961	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1934	1,174	7,455	14,687	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1935	1,174	7,455	13,513	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1936	1,174	7,455	12,339	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1937	1,174	7,455	11,165	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1938	1,174	7,455	9,991	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1939	1,174	7,455	8,817	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1940	1,174	7,455	7,643	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1941	1,174	7,455	6,469	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1942	1,174	7,455	5,295	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1943	1,174	7,455	4,121	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1944	1,174	7,455	2,947	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1945	1,174	7,455	1,773	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1946	1,174	7,455	599	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1947	599	7,455	6,854	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1948	1,174	7,455	5,680	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1949	1,174	7,455	4,506	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1950	1,174	7,455	3,332	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1951	1,174	7,455	2,158	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1952	1,174	7,455	984	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1953	984	7,455	7,925	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1954	1,174	7,455	6,751	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1955	1,174	7,455	5,577	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1956	1,174	7,455	4,403	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1957	1,174	7,455	3,229	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1958	1,174	7,455	2,055	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1959	1,174	7,455	881	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1960	881	7,455	7,829	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1961	1,174	7,455	6,655	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1962	1,174	7,455	5,481	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1963	1,174	7,455	4,307	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1964	1,174	7,455	3,133	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1965	1,174	7,455	1,959	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1966	1,174	7,455	785	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1967	785	7,455	7,625	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1968	1,174	7,455	6,451	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1969	1,174	7,455	5,277	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1970	1,174	7,455	4,103	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1971	1,174	7,455	2,929	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1972	1,174	7,455	1,755	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1973	1,174	7,455	581	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1974	581	7,455	7,329	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1975	1,174	7,455	6,155	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1976	1,174	7,455	4,981	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
1977	1,174	7,455	3,807	38,000.00	29,000.00	26,000.00	5,000.00	-	98,000.00
Total	49,811	-	-	1,520,000.00	1,160,000.00	1,040,000.00	200,000.00	-	3,920,000.00

By States

Table 20.-
Classification of Blister Rust Control Funds Used on Ribes Eradication Work Under Regular Cooperative Program in Northeastern States During 1933

(Not including special nursery sanitation and black currant eradication work)

State	Individuals	Towns	Counties	State B.R. Appropriation	Other State Funds	Federal Funds*	Total
Me.	76.83	4,740.37	-	1,781.88	-	422.65	7,021.73
N.H.	344.78	6,405.22	-	3,898.97	10,923.81	-	21,572.78
Vt.	1,678.34	-	-	103.46	-	92.64	1,874.44
Mass.	2,840.44	-	-	6,014.95	236.30	369.75	9,461.44
Conn.	-	-	-	696.90	-	-	696.90
N.Y.	3,436.14	-	694.49	23,703.69	2,604.39	-	30,438.71
N.E.& N.Y.	8,376.53	11,145.59	694.49	36,199.85	13,764.50	885.04	71,066.00
Pa.	96.14	-	-	2,763.92	-	415.73	3,275.79
All States	8,472.67	11,145.59	694.49	38,963.77	13,764.50	1,300.77	74,341.79

The funds spent on the cooperative Ribes eradication project were for laborers, scouts, linemen, and foremen. The cost of the state checkers in New Hampshire and the eradication assistants in New York and Pennsylvania are not included in this project.

The total cost of the regular cooperative Ribes eradication work ($74,341.79) represents 14.0 per cent of all state and Federal expenditures on all such projects in the Northeastern States during 1933.

Table 21.-Percentage of Total State and Federal Funds, in Respective States, Derived from Various Sources and Expended on the Project "Ribes Eradication"

State	Individuals	Towns	Counties	State B.R. Appropriation	Other State Funds	Federal Funds*	Total
Me.	1.1	67.5	-	25.4	-	6.0	100.0
N.H.	1.6	29.6	-	18.1	50.7	-	100.0
Vt.	4.9	-	-	5.5	-	89.6	100.0
Mass.	30.0	-	-	63.6	2.5	3.9	100.0
Conn.	-	-	-	100.0	-	-	100.0
N.Y.	11.3	-	2.3	77.9	8.5	-	100.0
N.E.& N.Y.	11.8	15.7	1.0	50.9	19.4	1.2	100.0
Pa.	2.9	-	-	84.4	-	12.7	100.0
All States	11.4	15.0	0.9	52.4	18.5	1.8	100.0

*Used for Ribes scouting.

Table 20.-
Classification of States Most Control Trade Used on Dives Prediction Made
Under Federal Cooperative Program in Northeastern States During 1932

(Not including special monetary sanction and black current eradication work)

State	Invividuals	Towns	Counties	State U.S. Government	Other State Funds	Federal Funds*	Total
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The funds spent on the cooperative fibre eradication project were for labourers
supervision, and interest. The cost of the state observers in New Hampshire and the
eradication activities in New York and Pennsylvania are not included in this project.

The total cost of the regular cooperative fibre eradication work ($[illegible])
represents 14.0 per cent of all dollar [illegible]
in the Northeastern States during 1932.

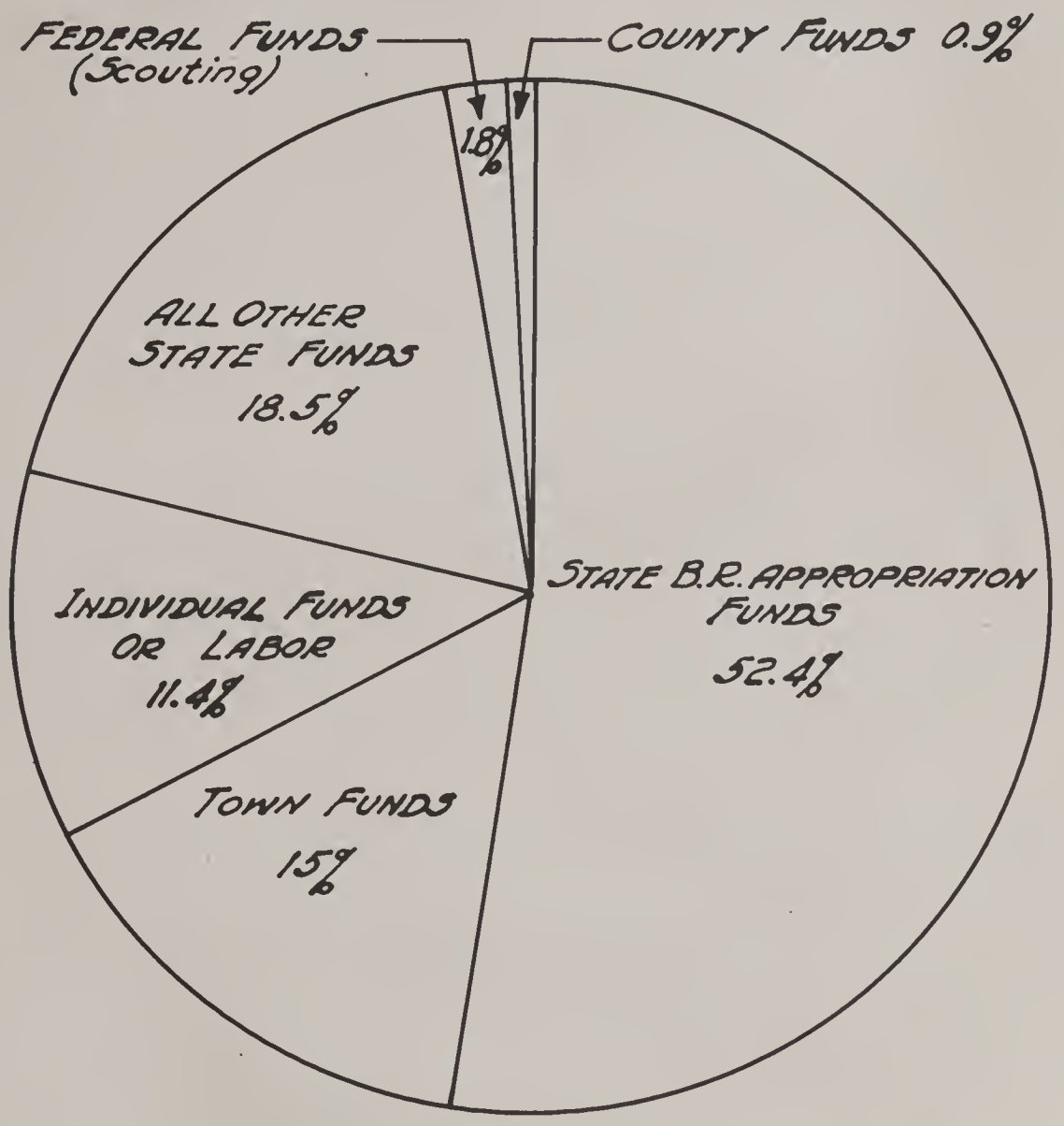
Table 21.-Percentages of Total State and Federal Funds, by Separate
States, Derived from Various Sources and Used in
the Project "Fibre Eradication"

State	Individuals	Towns	Counties	State U.S. Government	Other State Funds	Federal Funds*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Used for Rhine scouting.

SOURCE OF TOTAL FUNDS SPENT ON RIBES ERADICATION WORK UNDER REGULAR COOPERATIVE PROGRAM IN NORTHEASTERN STATES DURING - 1933.

(Excluding nursery sanitation and black currant eradication)



TOTAL COST OF RIBES ERADICATION = $74,341.79

E.C.W. CONTROL PROGRAM

The E.C.W. program in the Northeastern States provided an excellent opportunity for extending the application of blister rust control measures to unprotected white pine areas of commercial and scenic importance. Prior control work on many of these areas had been prevented either by lack of cooperation or because the cost of eradicating the existing Ribes was excessive under ordinary conditions. The control project was especially adapted to the E.C.W. program, since the Ribes eradication work required chiefly manual labor and only a small expenditure for equipment. The states welcomed this control project not only for the contemplated protective results, but because it offered a means of giving immediate and effective employment, under regular trained supervision, to hundreds of C.C.C. men during the organization period when other projects for various reasons could not be put into action. During these first few weeks, blister rust control gave many of the enlisted men their first opportunity to become acquainted with the woods, to learn discipline, and to obtain an appreciation of a day's work. At the winter meeting of New England Section of the Society of American Foresters, Mr. Tillotson, in charge of the E.C.W. program in the Northeastern States, publicly remarked that he wished to commend the blister rust control organization for the way it handled its project in connection with the E.C.W. program. He mentioned that this control organization being established and set to go at the start of the work accomplished excellent results without delay or confusion.

Ribes eradication work was conducted from a total of 114 C.C. camps in the Northeastern States. (See Table 22.) Five of these camps were located in the White Mt. National Forest, one in the Green Mt. National Forest, two at Acadia National Park and the other 106 were state camps scattered over the forest region of New England, New York and Pennsylvania. Control work was limited to public lands in New York, Pennsylvania and Massachusetts. In the other states, Ribes eradication was performed on both public and private lands, over 87 percent of the acreage worked under this program in these latter states being an individually owned property.

Control work from some of the Pennsylvania camps was started May 22; but in the other states, most of the camps were not in a position to do field work until the latter part of June. The number of enlisted men employed on control work necessarily varied from day to day, the maximum number of men at any one time being 3294. Three of the Maine camps and two in New York were devoted entirely to Ribes eradication work from June to September. The number of enlisted men assigned to blister rust control work at each of the other 109 camps ranged from 6 to 100. The field activities of these men were directed by 204 E.C.W. technical foremen and checkers and 36 state foremen. This combined force was supervised by the regular permanent control personnel, consisting of state leaders and 23 district agents provided by the Division of Blister Rust Control.

T.C.C. CONTROL PROGRAM

The T.C.C. program in the Northeastern States provided an excellent opportunity for extending the application of blister rust control measures to unprotected white pine areas of commercial and scenic importance. Prior control work on many of these areas had been prevented either by lack of cooperation or because the cost of eradicating the existing Ribes was excessive under ordinary conditions. The control project was especially adapted to the T.C.C. program, since the Ribes eradication work required chiefly manual labor and only a small expenditure for equipment. The states welcomed this control project not only for the contemplated protective results, but because it offered a means of giving immediate and effective employment, under regular trained supervision, to hundreds of C.C.C. men during the organization period when other projects for various reasons could not be put into action. During these first few weeks, blister rust control gave many of the enlisted men their first opportunity to become acquainted with the woods, to learn discipline, and to obtain an appreciation of a day's work. At the winter meeting of New England Section of the Society of American Foresters, Mr. Tillotson, in charge of the T.C.C. program in the Northeastern States, publicly remarked that he wished to commend the blister rust control organization for the way it handled its project in connection with the T.C.C. program. We mentioned that this control organization being established and set to go at the start of the work accomplished excellent results without delay or confusion.

Ribes eradication work was conducted from a total of 114 C.C. camps in the Northeastern States. (See Table 22.) Five of these camps were located in the White Mt. National Forest, one in the Green Mt. National Forest, two at Acadia National Park and the other 108 were state camps scattered over the forest region of New England, New York and Pennsylvania. Control work was limited to public lands in New York, Pennsylvania and Massachusetts. In the other states, Ribes eradication was performed on both public and private lands, over 87 percent of the acreage worked under this program in these latter states being on individually owned property.

Control work from some of the Pennsylvania camps was started May 22; but in the other states, most of the camps were not in a position to do field work until the latter part of June. The number of enlisted men employed on control work necessarily varied from day to day, the maximum number of men at any one time being 3294. Three of the Maine camps and two in New York were devoted entirely to Ribes eradication work from June to September. The number of enlisted men assigned to blister rust control work at each of the other 109 camps ranged from 6 to 100. The field activities of these men were directed by 204 T.C.C. technical foremen and checkers and 36 state foremen. This combined force was supervised by the regular permanent control personnel, consisting of state leaders and 23 district agents provided by the Division of Blister Rust Control.

Table 22.-Distribution of Work and Personnel Employed on E.C.W. Ribes Eradication Projects in Northeastern States During 1933

State	No. C.C.C. Camps		No. Towns Where Eradication Work Performed	Period Work Performed	Personnel Employed	
	State	Federal			Ave. No. Enlisted Men Per Day	No. Technical Foremen and Checkers
Maine	3	3	13	5/29-9/29	389	47
N.H.	5	4	33	6/1 -9/22	397	42
Vt.	6	1	17	6/20-9/15	187	15
Mass.	12	-	17	7/1 -9/30	99	8
R.I.	3	-	3	6/1 -9/30	22	4
Conn.	7	-	19	6/1 -9/28	144	12
N.Y.	8	-	19	6/1 -9/28	441	67*
N.E. & N.Y.	44	8	121	-	1,679	195
Pa.	62	-	62	5/22-9/29	344(ave.)	45(ave.)
All States	106	8	183	-	2,023	240

*Includes 36 state foremen

The enlisted personnel spent a total of 122,405 eight-hour man days on the Ribes eradication project during the period from May to September. Only 68.7 percent of this time was actually consumed in the field eradicating Ribes. As a result of this work, 245,318 acres were cleared of 5127 cultivated Ribes and 8,211,114 wild bushes, or 33.5 wild Ribes per acre. All of the work was done by crews in strip formation, except on 8377 acres which were covered by scouts.

Table 23.-Percentage of E.C.W. Enlisted Personnel's Total Time Spent on Actual Ribes Eradication Work - 1933

Maine	66.0
N.H.	67.9
Vt.	66.3
Mass.	70.3
R.I.	72.8
Conn.	75.2
N.Y.	62.5
Pa.	75.0
All States	68.7

It is impossible to give accurate cost figures for this project. However, it is known that the time spent by the technical foremen and checkers in supervising the work cost $78,048.80. Transportation for the crews totaled $15,899.78. The enlisted men were each paid $1.00 per day, and the cost of food per man averaged 35 cents per day. On the basis of total time and the above figures, excluding only supervision, the cost amounted to 74.2 cents per acre. Adding in the cost of supervision increases the per acre cost to $1.06. These per acre costs are considerably higher than the average cost of eradicating Ribes during previous years. It may be attributed in part to the following causes. The sites selected for the C.C. work usually represented difficulty factors above the average. The number of Ribes eradicated per acre by the C.C. men averaged over three times as many as in the regular work. The enlisted personnel

Table 22.-Distribution of Work and Personnel Employed on C.C.C. Tribe Eradication Projects in Northeastern States During 1933

State	No. C.C.C. Camps		No. Towns Where Eradication Work Performed	Period Work Performed	Personnel Employed	
	State	Federal			Ave. No. Enlisted Men Per Day	No. Technical Foremen and Checkers
Ore.	3	3	14	5/24-9/24	748	47
N.H.	5	4	43	6/1 -9/22	397	42
Del.	0	1	17	6/20-9/15	187	17
Ind.	12	-	17	6/1 -9/30	99	8
Ill.	3	-	4	6/1 -9/30	42	4
Minn.	7	-	49	6/1 -9/25	144	12
Ky.	5	-	13	6/1 -9/25	441	47*
Va.	14	6	121	-	3,679	195
Pa.	22	-	38	6/22-9/29	214(ave.)	45(ave.)
Total	106	5	187	-	5,083	540

*Includes 36 state foremen

The enlisted personnel spent a total of 122,405 eight-hour man days on the Ribes eradication project during the period from May to September. Only 68.7 percent of this time was actually consumed in the field eradicating Ribes. As a result of this work, 2463,318 acres were cleared of 3127 cultivated Ribes and 3,211,114 wild bushes, or 35.5 wild Ribes per acre. All of the work was done by crews in strip formation, except on 8377 acres which were covered by scouts.

Table 23.-Percentage of C.C.C. Enlisted Personnel's Total Time Spent on Actual Ribes Eradication Work - 1933

Maine	66.0
N.H.	67.3
Vt.	56.3
Mass.	70.3
R.I.	72.8
Conn.	73.2
N.Y.	62.3
Pa.	72.0
All States	68.7

It is impossible to give accurate cost figures for this project. However, it is known that the time spent by the technical foremen and checkers in supervising the work cost $73,043.10. Transportation for the crews totaled $15,699.78. The enlisted men were each paid $1.00 per day, and the cost of food per man averaged 35 cents per day. On the basis of total time and the above figures, excluding only supervision, the cost amounted to 74.2 cents per acre. Adding in the cost of supervision increases the per acre cost to $1.06. These per acre costs are considerably higher than the average cost of eradicating Ribes during previous years. It may be attributed in part to the following causes. The sites selected for the C.C.C. work usually represented difficulty factors above the average. The number of Ribes eradicated per acre by the C.C. men averaged over three times as many as in the regular work. The enlisted personnel

consisted chiefly of men from the cities with little or no experience in manual labor and woods work. During the first few weeks, the necessity of emphasizing the fundamentals of Ribes eradication to a constantly changing and inexperienced personnel prevented refinements in crew methods to eliminate lost motion and to increase crew flexibility to meet varying field conditions. Lack of transportation often caused the men to walk more than two miles each way to and from work, which was not only time consuming but fatiguing to inexperienced men. The practice of requiring crews in some camps to report back to camp for the noon meal not only required considerable time, but caused a physical reaction in the personnel that was not favorable to productive efforts. Greatly increased results on a man day basis should, however, be obtained during 1934. The new regulations insure each enlisted man performing 30 hours of actual field work per week and the camps are now so well established and equipped that a maximum of efficiency should prevail, thus overcoming the difficulties experienced in 1933.

Volumes might be recorded regarding the conduct of the E.C.W. control project, but suffice it to say that under all the circumstances involved, the work that was accomplished during 1933 was well and thoroughly done. This statement is based on numerous inspections made by the camp checkers and by the administrative officials. The supervisory personnel acquitted themselves commendably in all respects and the enlisted men, in most cases, gave the job the best that was in them during the time they spent in the field. The project has not only resulted in the protection of thousands of acres of valuable pine; but of even greater importance, it has helped to rehabilitate thousands of young men who were on the verge of despair prior to the inauguration of the E.C.W. program.

consisted chiefly of men from the cities with little or no experience in manual labor and woods work. During the first few weeks, the necessity of emphasizing the fundamentals of fitness application to a constantly changing and inexperienced personnel prevented refinements in crew methods to eliminate lost motion and to increase crew flexibility to meet varying field conditions. Lack of transportation often caused the men to walk more than two miles each way to and from work, which was not only time consuming but fatiguing to inexperienced men. The practice of requiring crews in some camps to report back to camp for the noon meal not only required considerable time, but caused a physical reaction in the personnel that was not favorable to productive efforts. Greatly increased results on a man day basis should, however, be obtained during 1934. The new regulations insure each enlisted man performing 30 hours of actual field work per week and the camps are now so well established and equipped that a maximum of efficiency should prevail, thus overcoming the difficulties experienced in 1933.

Volumes might be recorded regarding the conduct of the C.C.C. control project, but suffice it to say that under all the circumstances involved, the work that was accomplished during 1933 was well and thoroughly done. This statement is based on numerous inspections made by the camp checkers and by the administrative officials. The supervisory personnel acquitted themselves commendably in all respects and the enlisted men, in most cases, gave the job the best that was in them during the time they spent in the field. The project has not only resulted in the protection of thousands of acres of valuable timber; but of even greater importance, it has helped to rehabilitate thousands of young men who were on the verge of despair prior to the inauguration of the C.C.C. program.

Table 24.- Summary of all Ribes Eradication Work under E.C.W. Program in Northeastern States During 1933

(Excludes Nursery Sanitation)

State	Type of Erad.	Acreage Worked	Ribes Pulled		Man Hours Enlisted Men		No.8 Hr. Man Days Scouting by Tech. Foremen	Total Cost of Eradication Work*	Per Acre	
			Wild	Cult.	Erad. Ribes	Total			Cost	Ribes
	Initial	57,881	1,371,544	3,997	98,895½	152,563	76½	$ 28,557.27	.493	23.7
Me.	Re-Erad.	7,323	128,145	53	12,567	16,289	58	3,198.20	.437	17.5
	Total	65,204	1,499,689	4,050	111,462½	168,852	134½	31,755.47	.487	23.0
	Initial	34,079	2,447,871	373	105,717½	155,093½	-	30,381.60	.892	71.8
N.H.	Re-Erad.	8,003	290,298	-	14,919½	22,679	9	4,490.44	.561	36.3
	Total	42,082	2,738,169	373	120,637	177,772½	9	34,872.04	.829	65.1
	Initial	6,204	112,181	30	15,814¾	23,552	-	4,498.14	.726	18.1
Vt.	Re-Erad.	4,680	64,356	3	12,800½	19,631	-	3,750.16	.801	13.8
	Total	10,884	176,537	33	28,615¼	43,183	-	8,248.30	.758	16.2
	Initial	4,502	82,685	-	6,879	9,658	-	1,732.68	.385	18.4
Mass.	Re-Erad.	7,305	94,070	49	15,929	22,796	28¼	4,238.93	.580	12.9
	Total	11,807	176,755	49	22,808	32,454	28¼	5,971.61	.506	15.0
	Initial	80	129	-	471	507	-	97.07	1.21	1.6
R.I.	Re-Erad.	4,943	3,212	86	14,287¼	19,774½	-	3,805.81	.770	0.6
	Total	5,023	3,341	86	14,758¼	20,281½	-	3,902.88	.777	0.7
	Initial	-	-	-	-	-	-	-	-	-
onn.	Re-Erad.	38,865	218,428	109	27,708	62,561	18	11,602.41	.299	5.6
	Total	38,865	218,428	109	27,708	62,561	18	11,602.41	.299	5.6
	Initial	5,327	125,811	70	42,255	67,608	-	12,465.85	2.34	23.6
.Y.	Re-Erad.	28,209	1,012,838	113	97,695	156,312	-	28,820.65	1.02	35.9
	Total	33,536	1,138,649	183	139,950	223,920	-	41,286.50	1.23	34.0
.Eng.	Initial	108,073	4,140,221	4,470	270,032¾	408,981½	76½	77,732.61	.719	38.3
and	Re-Erad.	99,328	1,811,347	413	195,906¼	320,042½	113¼	59,906.60	.603	18.2
.Y.	Total	207,401	5,951,568	4,883	465,939	729,024	189¾	137,639.21	.664	28.7
	Initial	17,255	1,444,461	204	84,809	115,472	26	20,577.07	1.19	83.7
a.	Re-Erad.	20,662	815,085	40	102,876	134,744	-	23,926.08	1.16	39.4
	Total	37,917	2,259,546	244	187,685	250,216	26	44,503.15	1.17	59.6
11	Initial	125,328	5,584,682	4,674	354,841¾	524,453½	102½	98,309.68	.784	44.6
tates	Re-Erad.	119,990	2,626,432	453	298,782¼	454,786½	113¼	83,832.68	.699	21.9
	Total	245,318	8,211,114	5,127	653,624	979,240	215¾	$182,142.36	.742	33.5

81,703 122/407 1726

*Excludes cost of supervisory work by technical foremen and checkers.

Table 24.- [illegible] Expenditures for Water and Sewer Utilities by Type of Function and Object for Municipalities Reporting During 1971

(Preliminary Data Are Subject to Revision)

Type of Function and Object	All Functions	Water Supply			Sewerage			Combined Water and Sewer		
		Total	Operation and Maintenance	Capital Outlay	Total	Operation and Maintenance	Capital Outlay	Total	Operation and Maintenance	Capital Outlay
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Personal services	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Contractual services	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Supplies	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Capital outlay	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Land	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Buildings	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Improvements other than buildings	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Machinery and equipment	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Construction in progress	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]
Debt service	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Interest on debt	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Redemption of debt	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Intergovernmental expenditure	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
To other governments	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
To utility systems	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Miscellaneous	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	-	[illegible]	[illegible]	-
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Includes cost of engineering work by Municipal Forces not chargeable to specific projects.

Table 25.- Summary of Ribes Eradication Work Performed on Federal Lands under the E.C.W. Program in the Northeastern States During 1933.

Project	Type of Erad.	Acreage Worked	Ribes Pulled		Man Hours Enlisted Personnel		No. 8 Hr. Man Days Scouting by Tech. Foremen	Total Cost of Eradication Work*	Per Acre	
			Wild	Cult.	Erad. Ribes	Total			Cost	Ribes
Acadia National Park	Initial	4,741	129,628	212	20,417	27,223	-	$4,839.89	$1.02	27.3
	Re-Erad.	2,328	14,956	-	5,710	7,613	58	1,583.34	.68	6.4
	Total	7,069	144,584	212	26,127	34,836	58	6,423.23	.909	20.5
White Mt. National Forest	Initial	786	42,005	-	5,820	7,852 1/3	-	1,548.64	1.97	53.4
	Re-Erad.	1,858	129,136	-	4,750 3/4	6,883 1/3	9	1,398.36	.753	69.5
	Total	2,644	171,141	-	10,570 3/4	14,736	9	2,947.00	1.11	64.7
Total	Initial	5,527	171,633	212	26,237	35,075 1/3	-	6,388.53	1.16	31.1
	Re-Erad.	4,186	144,092	-	10,460 3/4	14,496 1/3	67	2,981.70	.712	34.4
	Total	9,713	315,725	212	36,697 3/4	49,572	67	$9,370.23	.965	32.5

*Excludes cost of supervisory work by technical foremen and checkers.

The work at Acadia National Park includes 1,525 acres covered on private lands, most of which is potential Park area or was worked to protect pines on adjacent Park lands.

Crews from the C.C.C. camps on the White Mountain National Forest also worked an additional 5,035 acres on private lands, all but 68 acres being initial work. A total of 300,149 wild Ribes were removed in connection with these projects which required 10,512 man hours labor by the enlisted personnel.

Table 25.- Summary of Fiber Production Total Expenses by Principal Topographical Regions in the U.S.A. From Data in Fiber Production Estimates Circular 1077.

Project	Type of Terrain	Average Terrain Index	Miles Planted		Man Hours Initiated Treatment		Man Hours Required for Mech. Farming	Total Cost of Eradication*
			Total	Per Sq. Mile	Total	Per Sq. Mile		
Arctic	Pitted	0.741	109,068	417	0,317	2,627	-	$ 1,000.00
Mountain	Co-ordinated	2,334	14,065	-	5,710	1,845	85	5,645.70
Farm	Plot	1,207	7,954	210	3,147	24,572	52	2,847.37
White Mt.	Pitted	700	45,205	-	3,000	1,000	-	2,000.00
Station	Co-ordinated	2,658	129,170	-	3,752	1,000	9	1,000.00
Forest	Plot	1,000	171,132	-	10,000	1,000	6	5,017.02
Pitted		5,247	111,252	18	5,317	24,715	-	3,000.00
Co-ordinated		1,245	141,002	-	10,000	1,000	57	3,001.70
Plot		2,117	71,147	419	20,572	3,576	47	1,017.43

*Adjusted cost of supervisory work by technical foreman and checkers.

The work at the Bethoni Fort included 1,505 acres covered on Pitted Land, most of which is potential Farm area or was noted to protect land on adjacent Farm Lands.

Three type the U.S.D. crops on the Lake Mountain Unplanned Forest also worked on additional 3,040 acres on private lands, all but 64 acres being initial work. A total of 320,149 man hours were required in completing with these projects which required 10,312 man hours labor by the enlisted personnel.

N.R.A. CONTROL PROGRAM

The Public Works Administration allotted $2,050,000 to the Bureau of Plant Industry on August 22, 1933 for blister rust control work during the fiscal years 1934 and 1935. The Division of Blister Rust Control was made directly responsible for organizing and directing the work and for the effective expenditure of the money. The field activities were directly supervised by the permanent state leaders and district agents of this Division. General supervision was provided by the federal district field offices. Labor was secured through the local offices of the Public Welfare Agencies and the National Reemployment Service. The rate of pay for laborers was established at 50 to 60 cents per hour. Experienced foremen and supervisors were recommended by the state leaders and appointed as agents of the Bureau of Plant Industry at monthly salaries ranging from $110 to $150. Each crew normally consisted of 10 laborers, 2 straw bosses and a foreman. In practice, the crew was usually divided into two units, each of which worked independently but in adjacent areas.

Blister rust control is an ideal project for an unemployment relief program since only a minimum expenditure is required for equipment, making it possible to use practically all of the funds for wages. Due to the acuteness of the unemployment situation in many localities, it was decided to proceed with the Ribes eradication work in spite of the late date. Within a few days after approval of the project at Washington, crews were at work in all the Northeastern States, except New Hampshire and New Jersey. It was possible to select areas where the Ribes were quite numerous and where defoliation had not advanced to a dangerous degree.

Table 26.- Distribution of Work and Personnel Employed on N.R.A. Ribes Eradication Project in Northeastern States During 1933

State	No. Towns Where Erad. Work Performed	Personnel Employed				Labor Man Hours Erad. Ribes	Total Man Days (Foreman and Supervisors)
		Laborers and Straw Bosses	Foremen	Supervisors	Total		
Me.	8	96	19	4	119	8,406	400
Vt.	8	197	18	2	217	15,004	314
Mass.	7	79	8	-	87	7,158.5	136½
R.I.	1	10	-	-	10	880	-
Conn.	6	83	6	2	91	6,984	240
N.Y.	4	24	4	-	28	2,152.5	66
Pa.	5	127	11	-	138	7,359	142
All States	39	616	66	8	690	47,944.5	1,298*

*Includes 42 man days worked by state men in Massachusetts and Connecticut.

In the Northeastern States, a total of 616 laborers and straw bosses, 66 foremen and 8 supervisors were employed from September 5 - 30. In Rhode Island and New York about forty men were continued on the work for two weeks in October. The laborers and straw bosses were given a total of 47,945 man hours of employment, while the foremen and supervisors worked a total of 1,298 man days. The combined efforts of these men resulted in 24,023 acres being cleared of 694,187 wild Ribes and 228 cultivated bushes at a cost of $29,143.47 or $1.21 per acre. This cost includes the time of the farmer while directing the crew work. The balance of their time and the total time of the supervisors cost $2,007.15. Over 87 percent of the acreage was on individually owned lands.

Table 27.-Summary of Ribes Eradication Work Under N.R.A. Program In Northeastern States During 1933

(Excluding nursery sanitation and special black currant eradication)

State	Type of Erad.	Acreage Worked	Ribes Pulled Wild	Man Hrs. by Laborers	Man Days by Foremen**	Cost** N.R.A.	State	Town	Total	Per Acre Cost	Ribes
Me.	Initial	5,185	146,620*	8,406	215	5,229.20	31.50	-	5,260.70	1.01	28.2
	Re-Erad.	-	-	-	-	-	-	-	-	-	-
	Total	5,185	146,620	8,406	215	5,229.20	31.50	-	5,260.70	1.01	28.2
Vt.	Initial	6,063	91,190	10,146½	172	6,112.58	-	81.00	6,193.58	1.02	15.0
	Re-Erad.	3,489	22,975	4,857½	71½	2,937.15	-	39.00	2,976.15	.85	6.59
	Total	9,552	114,165	15,004	243½	9,049.73	-	120.00	9,169.73	.96	12.0
Mass.	Initial	1,751	117,166	4,819	63	2,889.22	29.53	-	2,918.75	1.67	66.9
	Re-Erad.	1,569	7,241	2,339½	42	1,343.20	69.06	-	1,412.26	.90	4.62
	Total	3,320	124,407	7,158½	105	4,232.42	98.59	-	4,331.01	1.30	37.5
R.I.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	290	247	880	-	627.72	-	-	627.72	2.14	.85
	Total	290	247	880	-	627.72	-	-	627.72	2.14	.85
Conn.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	2,634	70,086	6,984	166	4,329.28	-	-	4,329.28	1.64	26.6
	Total	2,634	70,086	6,984	166	4,329.28	-	-	4,329.28	1.64	26.6
N.Y.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	1,376	73,521	2,152½	66	1,358.59	-	-	1,358.59	.98	53.4
	Total	1,376	73,521	2,152½	66	1,358.59	-	-	1,358.59	.98	53.4
Pa.	Initial	431	88,729	1,626	16½	887.03	-	-	887.03	2.06	205.9
	Re-Erad.	1,235	76,640	5,733½	72	3,179.41	-	-	3,179.41	2.57	62.1
	Total	1,666	165,369	7,359½	88½	4,066.44	-	-	4,066.44	2.44	99.3
All States	Initial	13,430	443,705*	24,997½	466½	15,118.03	61.03	81.00	15,260.06	1.14	33.0
	Re-Erad.	10,593	250,710	22,947	417½	13,775.35	69.06	39.00	13,883.41	1.31	23.7
	Total	24,023	694,415*	47,944½	884	28,893.38	130.09	120.00	29,143.47	1.21	28.9

*Includes 228 cultivated bushes.
**Includes time of foremen while directing crew work.

The high per acre cost may be attributed to higher wages paid to the N.R.A. personnel. The wage rate for laborers was 25 percent higher than the average rate paid for similar workers on the regular cooperative program. However, the N.R.A. laborers were limited to 30 hours work per week. The Nira men pulled over twice as many Ribes per acre as the men employed on cooperative control projects. The training of an inexperienced personnel and the necessity for doing especially careful work due to the partly defoliated condition of the Ribes were other factors directly affecting the cost. Inspections of the field work showed that the efficiency of Ribes eradication was up to standard. The work not only protected valuable pine areas, but gave needed employment to hundreds of men. The training gained by these local workers will prove helpful during the 1934 Ribes eradication season, since many of them will doubtless be available for reemployment at that time. Such training should also enable many of these men, who are pine owners, to maintain blister rust control on their own properties.

Table II.--Summary of Plane Testing--Navy Under U.S.A.-Lend-Lease Program
(Including Summary Information on Special Liaison Work)

Type of Plane	Assembly Operations (All)	Time Spent (All)	Time Spent on Preparation for Flight	Time Spent on Flight Operations	Time Spent on Post-Flight Operations	Time Spent on Ferrying	Time Spent on Miscellaneous Duties	Total Time Spent
A-1	2,450	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-2	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-3	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-4	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-5	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-6	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-7	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-8	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-9	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-10	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-11	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-12	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-13	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-14	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-15	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-16	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-17	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-18	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-19	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-20	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-21	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-22	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-23	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-24	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-25	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-26	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-27	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-28	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-29	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-30	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-31	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-32	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-33	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-34	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-35	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-36	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-37	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-38	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-39	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-40	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-41	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-42	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-43	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-44	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-45	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-46	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-47	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-48	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-49	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-50	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-51	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-52	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-53	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-54	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-55	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-56	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-57	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-58	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-59	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-60	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-61	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-62	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-63	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-64	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-65	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-66	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-67	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-68	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-69	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-70	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-71	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-72	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-73	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-74	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-75	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-76	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-77	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-78	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-79	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-80	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-81	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-82	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-83	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-84	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-85	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-86	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-87	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-88	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-89	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-90	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-91	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-92	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-93	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-94	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-95	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-96	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-97	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-98	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-99	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105
A-100	1,250	1,105*	1,105	1,105	1,105	1,105	1,105	1,105

*Indicates time of foreman while training crew work.
**Indicates time of foreman while training crew work.

The Navy pre-acute unit may be attributed to almost entire lack of personnel. The unit to for Lockheed was 20 percent higher than the average unit for Navy workers on the regular cooperative program. However, the U.S.A. laborers were utilized to 30 hours work per week. Time thus used [illegible] was spent over on the most critical in cooperative control problems. The [illegible] of the instructional material and the necessity for [illegible] to the Navy [illegible] that the Navy [illegible] directly affected the work. Instructions of the first unit that the Navy [illegible] Planes engaged in were to standard. The work out only [illegible] this phase, but some needed modification to conform to [illegible]. The training [illegible] the three local workers will prove helpful during the [illegible] reason, also some of them will doubtless be available for [illegible]. Such training should be [illegible] of further use, the [illegible] to [illegible] Britain representatives on their [illegible].

TOTAL RIBES ERADICATION WORK PERFORMED UNDER ALL PROGRAMS

(Excludes nursery sanitation and special black currant eradication)

The control work conducted under the regular and emergency programs in the Northeastern States during 1933 resulted in the destruction of 12,750,844 wild Ribes and 12,695 cultivated bushes on 552,855 acres at a total cost of $285,627.62, or 51.7 cents per acre. Of the total area examined for Ribes during 1933, 49.9 percent, or 275,710 acres, constituted reeradication work. The number of Ribes eradicated in 1933 was 33.8 percent greater than the highest number pulled during any previous year. The following table summarizes the Ribes eradication work for 1933.

Table 28.-Summary of 1933 Ribes Eradication Work in Northeastern States

Program		Reg. Coop.	E.C.W.	N.R.A.	Total
Acreage Worked	Initial	138,387	125,328	13,430	277,145
	Re-Erad.	145,127	119,990	10,593	275,710
	Total	283,514	245,318	24,023	552,855
Ribes Pulled	Wild	3,845,543	8,211,114	694,187	12,750,844
	Cult.	7,340	5,127	228	12,695
Total Man Hours		186,357	980,750	55,184	1,222,291
Total Cost* of Erad. to	Individuals	8,472.67	-	- -	8,472.67
	Towns	11,145.59	-	120.00	11,265.59
	County	694.49	-	-	694.49
	State	52,728.27	-	130.09	52,858.36
	B.P.I.	999.80	-	-	999.80
	Forest Service	300.97	-	-	300.97
	E.C.W.	-	$182,142.36	-	182,142.36
	N.R.A.	-	-	28,893.38	28,893.38
	Total	74,341.79	182,142.36	29,143.47	285,627.62
Per Acre Values	Ribes	13.6	33.5	28.9	23.1
	Man Hrs.	0.66	4.0	2.3	2.2
	Cost	.262	.742	1.21	.517

*Exclusive of supervision.

The data for the "Regular Cooperative" program include 461 acres (166 re-eradication) cleared of 31,569 wild Ribes on the Allegheny National Forest at a cost of $300.97 to the Forest Service and $50.96 to the Bureau of Plant Industry.

TOTAL PLANTS REGENERATION WORK EFFECTED UNDER ACT BOUGHAM

(Includes nursery sanitation and special black current eradication)

The control work conducted under the regular and emergency programs in the Northeastern States during 1933 resulted in the destruction of 12,750,844 wild Ribes and 12,645 cultivated bushes on 952,855 acres at a total cost of $249,627.62, or $4.7 cents per acre. Of the total area examined for Ribes during 1933, 49.9 percent, or 475,710 acres, constituted reexamination work. The number of Ribes eradicated in 1933 was 33.6 percent greater than the highest number pulled during any previous year. The following table summarizes the Ribes eradication work for 1933.

Table 24.--Summary of 1933 Ribes Eradication Work in Northeastern States

Program		Reg. Coop.	C.C.C.	W.P.A.	Total
Increased	Initial	1,345,327	125,326	12,440	271,143
	Re-trad.	1,462,127	119,990	10,903	273,020
	Total	2,807,454	245,316	23,023	544,163
Decreased	Field	1,686,643	4,211,114	609,197	12,750,844
	Calls.	1,340	3,167	456	12,645
Total Man Hours		1,651,357	980,750	95,134	1,222,991
Incidentals		6,472.67	-	-	9,472.67
Horses		11,145.79	-	150.00	11,295.79
Forage		634.49	-	-	634.49
Autos		52,182.47	-	120.02	52,802.49
P.C.C.		470.80	-	-	590.80
Forest Service		700.17	-	-	710.47
T.C.C.		-	182,142.56	-	182,142.56
T.E.A.		-	-	28,803.76	28,803.76
Total		74,341.79	182,142.56	29,373.47	285,857.82
Acre Losses	Piber	13.6	76.6	28.9	23.1
	Non Pre.	0.05	4.0	2.3	2.2
	Cost	.029	.172	1.23	.321

*Prelimits of supervision.

The data for the "Regular Cooperative" program include 461 acres (165 re-eradication) cleared of 31,359 wild Ribes on the Allegheny National Forest at a cost of $300.27 to the Forest Service and $90.05 to the Bureau of Plant Industry.

Table 29.- Summary of All Ribes Eradication Work Performed on Federal Lands In the Northeastern States

1933

Project	Program	Type of Erad.	Acreage Worked	Ribes Pulled		Total Man Hours	Cost				Per Acre	
				Wild	Cult.		E.C.W.	B.P.I.	Forest Service	Total	Cost	Ribes
Acadia National Park	E.C.W.	Initial	4,741	129,628	212	27,223	4839.89	-	-	4,839.89	1.02	27.3
		Re-Erad.	2,328	14,956	-	8,077	1583.34	-	-	1,583.34	.680	6.4
		Total	7,069	144,584	212	35,300	6423.23	-	-	6,423.23	.909	20.5
White Mt. National Forest	E.C.W.	Initial	786	42,005	-	7,852½	1548.64	-	-	1,548.64	1.97	53.4
		Re-Erad.	1,858	129,136	-	6,955½	1398.36	-	-	1,398.36	.753	69.5
		Total	2,644	171,141	-	14,808	2947.00	-	-	2,947.00	1.11	64.7
Allegheny National Forest	Regular	Initial	295	24,897	-	566	-	24.36	197.61	221.97	.752	84.4
		Re-Erad.	166	6,672	-	351½	-	26.60	103.36	129.96	.783	40.2
		Total	461	31,569	-	917½	-	50.96	300.97	351.93	.763	68.5
Totals		Initial	5,822	196,530	212	35,641½	6388.53	24.36	197.61	6,610.50	1.14	33.8
		Re-Erad.	4,352	150,764	-	15,384	2981.70	26.60	103.36	3,111.66	.715	34.6
		Total	10,174	347,294	212	51,025½	9370.23	50.96	300.97	9,722.16	.955	34.1

1924 - 1933, Inclusive

Project	Type of Erad.	Acreage Worked	Ribes Pulled		Total Cost						Per Acre	
			Wild	Cult.	E.C.W.	F.S.	P.S.	B.P.I.	State	Total	Cost	Ribes
Acadia National Park	Initial	12,467	633,548	212	4839.89	-	8345.53	3145.83	-	16,331.25	1.31	50.8
	Re-Erad.	2,328	14,956	-	1583.34	-	-	-	-	1,583.34	.680	6.4
	Total	14,795	648,504	212	6423.23	-	8345.53	3145.83	-	17,914.59	1.21	43.8
White Mt. National Forest	Initial	7,565	224,498	-	1548.64	1471.62	-	75.63	224.11	3,320.00	.439	29.7
	Re-Erad.	1,858	129,136	-	1398.36	-	-	-	-	1,398.36	.753	69.5
	Total	9,423	353,634	-	2947.00	1471.62	-	75.63	224.11	4,718.36	.501	37.5
Allegheny National Forest	Initial	891	129,019	8	-	507.71	-	136.56	-	644.27	.723	144.8
	Re-Erad.	627	19,993	-	-	272.06	-	71.29	-	343.35	.548	31.9
	Total	1,518	149,012	8	-	779.77	-	207.85	-	987.62	.651	98.2
Totals	Initial	20,923	987,065	220	6388.53	1979.33	8345.53	3358.02	224.11	20,295.52	.970	47.2
	Re-Erad.	4,813	164,085	-	2981.70	272.06	-	71.29	-	3,325.05	.691	34.1
	Total	25,736	1,151,150	220	9370.23	2251.39	8345.53	3429.31	224.11	23,620.57	.918	44.7

Table 29.- Summary of All Fiber Irradiation Work Performed on Federal Land In the Northwestern States

1973

Project	Program	Type of Proj.	Increased Worked	Fiber Pulled Ib.	Mean Pr.	Total Mean Pr.	Cost U.S.F.	Cost B.P.I.	Cost Forest Service	Cost Total	Co
Coeur d'Alene National Forest	I.D.F.	Initial	7,741	12,268	212	2,229	4,229.60	-	-	4,829.60	1.
		Re-Irrad.	2,345	1,465	-	5,077	1,583.35	-	-	1,583.35	.
		Total	7,049	14,464	212	35,306	6,023.25	-	-	6,023.25	.
Idaho Panhandle National Forest	I.D.F.	Initial	746	16,345	-	1,952	1,918.64	-	-	1,918.64	.
		Re-Irrad.	1,956	129,170	-	6,956	1,708.76	-	-	1,708.76	.
		Total	2,696	171,171	-	16,908	3,627.00	-	-	3,627.00	.
Clearwater National Forest		Initial	295	24,697	-	506	-	64.76	127.61	192.37	.
		Re-Irrad.	186	6,116	-	731	-	24.60	102.36	126.96	.
		Total	481	31,760	-	1,237	-	50.60	102.97	153.57	.
Kaniksu National Forest		Initial	5,655	106,250	212	6,388.52	4,124.70	24.70	1,712.61	6,610.50	1.
		Re-Irrad.	4,452	150,164	-	7,261.70	1,284.16	24.16	1,103.46	3,111.66	.
		Total	10,107	256,414	212	13,650.22	5,408.86	48.86	2,816.07	9,722.16	1.

1974 - 1975, Inclusive

Project	Program	Type of Proj.	Increased Worked	Fiber Pulled Ib.	Mean Pr.	Total Mean Pr.	Cost U.S.F.	Cost B.P.I.	Cost Forest Service	Cost Total	Co
Coeur d'Alene National Forest	I.D.F.	Initial	12,461	24,573	212	6,573	4,573.00	-	-	4,573.00	1.
		Re-Irrad.	2,329	14,950	-	14,950	1,950.00	-	-	1,950.00	.
		Total	14,790	39,523	212	21,523	6,523.00	-	-	6,523.00	.
Idaho Panhandle National Forest	I.D.F.	Initial	7,569	25,453	-	25,453	1,472.65	75.65	-	1,548.30	.
		Re-Irrad.	1,317	129,170	-	129,170	1,708.76	-	-	1,708.76	.
		Total	8,886	154,623	-	154,623	3,181.41	75.65	-	3,257.06	.
Clearwater National Forest		Initial	811	19,012	-	19,012	1,156.56	-	-	1,156.56	.
		Re-Irrad.	6527	19,092	-	19,092	771.69	-	-	771.69	.
		Total	1,718	38,104	-	38,104	1,928.25	-	-	1,928.25	.
Kaniksu National Forest		Initial	5,655	106,250	212	6,388.52	4,124.70	24.70	1,712.61	6,610.50	1.
		Re-Irrad.	4,452	150,164	-	7,261.70	1,284.16	24.16	1,103.46	3,111.66	.
		Total	10,107	256,414	212	13,650.22	5,408.86	48.86	2,816.07	9,722.16	1.

Table 30.

Summary of All Ribes Eradication Work on Public and Private Lands in Northeastern States

(Except special black currant eradication and nursery sanitation since 1929)

State	Period	Acreage Examined	Ribes Pulled		Total Cost	Per Acre	
			Wild	Cult.		Cost	Ribes
Me.	1933	96,182	2,251,325	4,987	60,260.18	.627	23.4
	1922-1933	2,698,605	21,438,770	122,498	282,677.58	.105	7.9
	1918-1933	2,879,235	22,097,499	124,077	302,385.72	.105	7.7
N.H.	1933	98,528	4,694,066	757	69,227.55	.703	47.6
	1922-1933	2,556,855	34,543,441	83,215	532,725.60	.208	13.5
	1918-1933	3,127,760	40,879,131	144,732	653,866.14	.209	13.1
Vt.	1933	27,219	323,145	228	22,984.56	.844	11.9
	1922-1933	226,984	2,314,648	10,870	101,644.92	.448	10.2
	1918-1933	244,962	2,586,791	11,152	115,897.43	.473	10.6
Mass.	1933	97,107	553,773	2,869	22,083.74	.227	5.7
	1922-1933	2,128,599	11,667,667	235,785	285,754.92	.134	5.5
	1918-1933	2,210,476	14,082,540	246,130	330,429.82	.149	6.4
R.I.	1933	5,313	3,588	86	6,427.72	1.21	0.68
	1922-1933	192,116	122,821	8,191	21,904.52	.114	0.64
	1918-1933	295,377	204,063	12,442	38,666.07	.131	0.69
Conn.	1933	42,513	300,299	109	22,058.70	.519	7.1
	1922-1933	291,916	2,170,849	22,383	88,364.06	.303	7.4
	1918-1933	305,386	2,296,112	22,391	95,726.17	.313	7.5
N.Y.	1933	141,323	1,928,002	3,396	93,776.97	.664	13.6
	1922-1933	930,256	16,174,281	44,723	607,891.35	.653	17.4
	1918-1933	1,004,408	21,289,219	58,466	809,904.26	.806	21.2
N.E. and N.Y.	1933	508,185	10,054,198	12,432	296,819.42	.584	19.8
	1922-1933	9,025,331	88,432,477	527,665	1,920,962.95	.213	9.8
	1918-1933	10,067,604	103,435,355	619,390	2,346,875.61	.233	10.3
Pa.	1933	44,670	2,696,646	263	66,857.00	1.50	60.4
	1922-1933	109,938	5,410,512	5,739	98,182.40	.893	49.2
	1918-1933	109,938	5,410,512	5,739	98,182.40	.893	49.2
All States	1933	552,855	12,750,844	12,695	363,676.42	.658	23.1
	1922-1933	9,135,269	93,842,989	533,404	2,019,145.35	.221	10.3
	1918-1933	10,177,542	108,845,867	625,129	2,445,058.01	.240	10.7

TABLE 31.-SUMMARY OF RIBES ERADICATION WORK IN NORTHEASTERN STATES 1918-1933 Incl.

(INITIAL AND RE-ERADICATION WORK)

STATE	Year 1918						Year 1919					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	4,910	91,862	235	5,179 23	1 05	18.70	9,216	333,775	–	6,136.10	.67	36.20
N.H.	66,292	959,315	8,427	26,089.09	.39	14.50	163,413	1,659,936	21,171	35,371 86	.22	10.15
VT.	4698	78,563	77	5,182.64	1 10	16 80	2,460	96,749	–	2,214.26	.90	39.32
MASS.	18,706	356,067	1,919	15,805 31	.84	19.03	10,849	201,882	2,374	8,156.18	.75	18.60
R.I.	12,715	13,927	492	3,527.97	.28	1.09	40,411	45,320	1,657	5,609.74	.14	1.12
CONN.	800	10,000	–	Est. 400.00	.50	12.50	2,500	31,000	–	2,323.34	.93	12 40
N.Y.	29,337	904,153	11,000	43,679.16	1.48	30 81	23,194	2,181,286	2,675	79,689.08	3.43	94.04
TOTALS	137,458	2,413,887	22,150	99,863 40	.73	17.60	252,043	4,549,948	27,877	139,500.56	.55	18.10

STATE	Year 1920						Year 1921						Totals 1918-1921					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	10,283	176,788	636	4,994.05	.49	17.19	156.221	56,304	708	3,398.76	.02	.36	180,630	658,729	1,579	19,708,14	.11	3.6
N.H.	203,373	2,061,996	22,206	37,038.66	.18	10.10	137,827	1,654,443	9,713	22,640.93	.16	12.00	570,905	6,335,690	61,517	121,140.54	.21	11-1
VT.	4,501	36,294	74	3,391.60	.75	8.06	6.319	60,537	131	3,464.01	.55	9.58	17,978	272.143	282	14,252.51	.79	15.1
MASS.	19,389	1,224,306	1,421	10,422.87	.54	63.14	32,933	632,618	4,631	10,290.54	.31	19.20	81,877	2,414,873	10,345	44,674.90	.55	29.5
R.I.	23,164	5,973	1,550	3.796.92	.16	.26	26,971	16,022	552	3,826.92	.14	.59	103,261	81,242	4,251	16,761.55	.16	0.8
CONN.	2,170	42,793	2	1,974.70	.91	19.72	8,000	41,470	6	2,664.07	.33	5.18	13,470	125,263	8	7,362.11	.56	9.3
N.Y.	7,438	753,790	47	32,043.94	4.31	101.30	14,183	1,275,709	21	46,600.73	3.29	89.90	74,152	5,114,938	13,743	202,012.91	2.72	69.0
TOTALS	270,318	4,301,940	25,936	93,662.74	.35	15.90	382,454	3,737,103	15,762	92,885.96	.24	9.80	1,042,273	15,002,878	91,725	425,912.66	.41	14.4

STATE	Year 1922						Year 1923						Year 1924					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	190,209	449.287	3,688	8.012 48	.042	2 3	336,452	1,209.282	12,095	19,333.16	.057	3.6	401,227	1,848,957	11,599	23,093.91	.057	4.6
N.H.	178,489	1,816,829	9.061	28,706.64	.161	10 2	268,237	3,496,733	24,779	51,651.48	.192	13.3	331,402	4,098,527	14,989	53,590.23	.162	12.4
VT.	13,512	201,906	812	6 150.24	455	15.0	25,190	278.570	1,234	8,498.43	.337	11.0	25,688	182,154	592	9,280.02	.361	7.1
MASS.	64,302	1,578.294	2368	13.375.09	.208	24.5	201 931	1,776.107	14 887	28,411.92	.140	7.8	159,776	2,025,036	38,777	34,772.98	.217	12.6
R.I.	11,500	11.764	132	1,840.00	.160	1.0	31,308	14,275	1,464	1,895.96	.060	0.5	52,480	24,711	2,953	2,302.01	.044	.5
CONN.	6.175	137,501	–	4.651.50	.753	22.2	14.062	288.333	248	6.863.14	.488	20.5	17.215	289,034	2,447	5,981.73	.347	16.7
N.Y.	11,030	654.231	–	34.082.70	3 09	59.3	15.459	906,617	367	44,229.78	2.87	57.3	25,198	1,061,368	2,501	40,907.02	1.62	42.1
TOTALS	475,217	4,849,812	16,061	96,818.65	.204	10.2	892,639	7,969,917	55,074	160,883.87	.180	8.9	1,012,986	9,527,787	73,858	169,927.90	.168	9.4

STATE	Year 1925						Year 1926					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	274,678	1,710,015	15,041	20,257.62	.073	6.2	304,437	3,106,519	17,562	21,280.01	.069	10.2
N.H.	261,710	3,293,951	6,402	44,925.60	.172	12.6	210,333	3,127,909	4,289	45,606.67	.217	14.9
VT.	26,622	317,837	640	9,058.12	.340	11.9	22,650	257,743	1,404	10,253.44	.453	11.4
MASS.	193,201	751,830	33,610	21,759.45	.111	3.8	189,230	1,088,039	25,596	27,281.37	.144	5.7
R.I.	25,640	4,994	1,928	1,519.04	.059	0.2	28,207	17,635	203	1,924.23	.068	0.6
CONN.	16,106	272,797	684	5,495.30	.341	16.9	22,257	182,826	330	5,062.35	.227	8.2
N.Y.	34,937	994,865	1,153	35,787.36	1.02	28.4	38,073	1,077.340	2,087	37,129.76	.975	28.3
TOTALS	834,894	7,346,289	59,458	138,802.49	.166	8.8	815,187	8,858,071	51,471	148,537.83	.182	10.9

STATE	Year 1927						Year 1928					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	261.481	2,601,639	10,225	22,513.71	086	9 9	203,067	1,595,792	8,778	22,597.90	.111	7.9
N.H.	226,019	2,672,166	2,510	41,072.84	.182	11.8	228,530	2,302,538	5,220	40,844.96	.179	10.1
VT.	19,405	280,781	314	8,233.95	.424	14.4	16,767	159,340	196	6,886.37	.411	9.5
MASS.	299,333	906,490	32 760	27,940.03	.093	3.1	242,933	523,400	34,153	29,769.26	.123	2.2
R.I.	9,735	22,279	521	1,700.86	.175	2.3	21,461	17,777	615	2,629.64	.119	0.8
CONN.	20,904	152,825	1 208	8,633.20	.413	7.3	75,105	123,385	1,364	8,013.84	.107	1.6
N.Y.	62,955	1,410,646	2,207	45,523.96	.723	22.4	95,849	1,957,769	10,235	50,605.43	.528	20.4
SUB-TOTALS N.E.-N.Y.	899,852	8,046,826	49,745	155,618.55	.173	8.9	883,712	6,680,001	60,561	161,347.40	.183	7.6
PA.	No	Regular	Ribes	Eradication	Work	was	performed	in Penn.	prior	to 1929.	–	–
ALL STATES	899,852	8,046,826	49,745	155,618.55	.173	8.9	883,712	6,680,001	60,561	161,347.40	.183	7.6

STATE	Year 1929						Year 1930						Year 1931					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	234,691	2,164.713	18,244	22,194.38	.095	9.2	197,885	2,123,777	10,573	24,042.46	.121	10.7	116,709	1,356,418	4,980	19,824.78	.169	11.6
N.H.	252,144	2.102,999	6,644	40,609.40	.161	8.3	224,870	2,840,230	3,197	48,596.21	.216	12.6	179,361	3,022,275	4,222	50,246.09	.280	16.9
VT.	13,300	110,671	459	6,495.47	.488	8.3	13.122	94.611	108	5.903.71	.450	7.2	11,660	49,114	132	4,125.07	.354	4.2
MASS.	264,840	841.759	32,881	32,486.51	.123	3.2	136,791	1,024,371	8,135	18,120.33	.132	7.5	115,529	264,215	6,658	13,116.83	.114	2.3
R.I.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CONN.	34,597	134.407	10,922	8,034.54	.232	3.9	29,595	44,159	3,595	4,241.46	.143	1.5	6,050	110,827	260	4,735.90	.783	18.3
N.Y.	127,756	1,982,671	6,745	65,466.48	.512	15.5	98,221	1,402,189	4,471	50,130.30	.510	14.3	123,558	1,502,930	5,023	56,764.66	.459	12.2
SUB-TOTALS N.E.-N.Y.	927,328	7,337,220	75,889	175,286.78	.189	7.9	700,484	7,529,337	30,099	151,034.47	.216	10.7	552,887	6,305,779	21,275	148,813.33	.269	11.4
PA.	5459	329,670	561	3.756.26	.688	60.4	11,745	656,768	863	8,631.48	.735	55.9	25,424	868,342	703	11,026.51	.434	34.2
ALL STATES	932 787	7,666,890	76,450	179,043.04	.192	8.2	712,229	8,186,105	30,962	159,665.95	.224	11.5	578,291	7,174,121	21,978	159,839.84	.276	12.4

STATE	Year 1932						Year 1933					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	81.587	1.022,986	4726	19,266 99	.236	12.5	96 182	2,251,325	4987	44 037 90	.458	23.4
N.H.	97 232	1.075 218	1145	17.647 93	.182	11 1	98 528	4,694,066	757	56,444 82	.573	47.6
VT.	11,849	58.776	4757	3,775.54	.319	5.0	27 219	323.145	228	19,292 47	.709	11.9
MASS.	161,606	334.353	3071	16.637 41	.103	2.1	97 107	553.773	2869	19.764.06	.204	5.7
R.I.	6 472	5,798	289	1,665 06	.257	0.9	5,313	3,588	86	4 530.60	853	0.7
CONN.	7.337	134.456	1216	4.592 40	.626	18.3	42,513	300,299	109	16,628 59	.391	7.1
N.Y.	155 897	1,295.653	6536	53.486.93	343	8.3	141,323	1,928 002	3396	73,083 80	.517	13.6
SUB-TOTALS N.E.-N.Y.	521.980	3.927,230	21,742	117.072.26	.224	7.5	508.185	10.054.198	12,432	233,782.24	.460	19 8
PA.	22,640	859.086	3349	7.911.15	.349	37 9	44,670	2,696.646	263	51,845.38	1.16	60.4
ALL STATES	544 620	4.786,316	25091	124 983 41	.229	8.8	552,855	12.750,844	12,695	285,627 62	.517	23.1

STATE	Totals 1922-1933					Grand Totals 1918-1933				
	Acres	No. Ribes		Total Cost	Per Acre	Acres	No. Ribes		Total Cost	Per Acre
		Wild	Cult.		Cost Ribes		Wild	Cult.		Cost Ribes
MAINE	2,698,605	21,438,770	122,498	366,455.30	.099 7.9	2,879,235	22,097,499	124,077	286,163.44	.099 7.7
N.H.	2,556,855	34,543,441	83,215	519,942.87	.203 13.5	3,127,760	40,879,131	144,732	641,083.41	.205 13.1
VT.	226,984	2,314,648	10,870	97,952.83	432 10.2	244,962	2,586,791	11,152	112,205.34	458 10.6
MASS.	2,128,599	11,667,667	235,785	283,435.24	.128 5.5	2,210,476	14,082,540	246,130	328,110.14	.148 6.4
R.I.	192,116	122,821	8,191	20,007.40	.104 0.6	295,377	204,063	12,442	36,768 95	.124 0.7
CONN.	291,916	2,170,849	22,383	82,933.95	.284 7.4	305,386	2,296,112	22,391	90,296.06	296 7.5
N.Y.	930,256	16,174.281	44,723	587.198 18	.631 17.4	1,004,408	21,289,219	58,466	789,211 09	.786 21.2
SUB-TOTALS N.E.-N.Y.	9,025,331	88,432,477	527,665	1,857.925.77	.206 9.8	10,067,604	103,435,355	619,390	2,283,838.43	.227 10.3
PA.	109,938	5.410.512	5.739	83.170.78	.757 49.2	109,938	5,410.512	5,739	83,170 78	.757 49.2
ALL STATES	9,135,269	93 842,989	533,404	1941,096 55	.212 10.3	10,177,542	108,845,867	625,129	2,367,009 21	.233 10.7

Includes all Ribes Eradicatio work performed under all programs However, all black currant elimination and nursery sanitation projects since 1929 are excluded.

SUMMARY OF INITIAL RIBES ERADICATION WORK IN NORTHEASTERN STATES 1918-1933 Incl.

STATE	Year 1918						Year 1919						Year 1920						Year 1921						Totals 1918-1921					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult		Cost	Ribes		Wild	Cult		Cost	Ribes		Wild	Cult		Cost	Ribes
MAINE	4,910	91,862	235	5,179.23	1.05	18.70	9,216	333,775	–	6,136.10	.67	36.20	10283	176,788	636	4,994.05	.49	17.19	156,221	56,304	708	3,398.76	.02	36	180,630	658,729	1,579	19,708.14	.11	3.6
N.H.	66,292	959,315	8,427	26,089.09	.39	14.60	163,413	1,659,936	21,171	35,371.86	.22	10.15	203,378	2,061,996	22,206	37,038.66	.18	10.10	137,827	1,654,443	9,713	22,640.93	.16	12.00	570,905	6,335,690	61,517	121,140.54	.21	11.1
VT.	4,698	78,563	77	5,182.64	1.10	16.80	2,460	96,749	–	2,214.26	.90	39.32	4,501	36,294	74	3,391.60	.75	8.06	6,319	60,537	131	3,464.01	.55	9.58	17,978	272,143	282	14,252.51	.79	15.1
MASS.	18,706	356,067	1,919	15,805.31	.84	19.03	10,849	201,882	2,374	8,155.18	.75	18.60	19,389	1,224,306	1,421	10,422.87	.54	63.14	32,933	632,618	4,631	10,290.54	.31	19.20	81,877	2,414,873	10,345	44,674.90	.55	29.5
R.I.	12,715	13,927	492	3,527.97	.28	1.09	40,411	45,320	1657	5,609.74	.14	1.12	23,164	5,973	1,550	3,796.92	.16	26	26,971	16,022	552	3,826.92	.14	.59	103,261	81,242	4,251	16,761.55	.16	0.8
CONN.	800	10,000	–	Est. 400.00	.50	12.50	2,500	31,000	–	2,323.34	93	12.40	2,170	42,793	2	1,974.70	.91	19.72	8,000	41,470	6	2,664.07	33	5.18	13,470	125,263	8	7,362.11	.55	9.3
N.Y.	29,337	904,153	11,000	43,679.16	1.48	30.81	23,194	2,181,286	2,675	79,689.08	3.43	94.04	7,438	753,790	47	32,043.94	4.31	101.30	14,183	1,275,709	21	46,600.73	3.29	89.90	74,152	5,114,938	13,743	202,012.91	2.72	69.0
TOTALS	137,458	2,413,887	22,150	99,863.40	.73	17.60	258,043	4,549,948	27,877	139,500.56	.55	18.10	270,318	4,301,940	25,936	93,662.74	.35	15.90	382,454	3,737,103	15,762	92,885.96	.24	9.80	1,042,273	15,002,878	91,725	425,912.66	.41	14.4

STATE	Year 1922						Year 1923						Year 1924						Year 1925						Year 1926					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	190,209	449,287	3,688	8,012.48	.042	2.3	336,432	1,208,998	12,095	19,327.36	.057	3.6	399,987	1,829,349	11,599	22,734.31	.057	4.6	274,034	1,700,870	15,041	20,070.86	.073	6.2	303,709	3,053,380	17,552	20,915.42	.069	10.1
N.H.	178,489	1,816,829	9,061	28,706.64	.161	10.2	267,807	3,490,130	24,779	51,604.66	.193	13.0	324,734	4,023,359	14,941	52,599.44	.162	12.4	237,702	3,180,730	5,996	42,408.99	.178	13.4	178,287	2,968,421	3,612	41,199.78	.231	16.6
VT.	13,512	201,906	812	6,150.24	.455	15.0	23,950	272,246	1,234	8,080.55	.337	11.4	24,714	177,187	592	8,951.78	.362	7.2	25,226	310,717	640	8,587.67	.340	12.3	16,800	227,908	1,404	8,281.99	.493	13.6
MASS.	64,302	1,578,294	2,368	13,375.09	.208	24.5	184,988	1,750,693	14,887	26,802.33	.145	9.5	158,465	2,023,070	38,777	34,648.43	.219	12.8	190,945	745,446	33,610	21,355.13	.112	3.9	183,085	1,078,821	25,596	26,697.59	.146	5.9
R.I.	11,500	11,764	132	1,840.00	.160	1.0	28,068	13,011	1,464	1,701.56	.061	0.5	47,480	22,361	2,953	2,092.01	.044	0.5	25,640	4,994	1,928	1,519.04	.059	0.2	25,537	16,438	203	1,674.23	.066	0.6
CONN.	6,175	137,501	–	4,651.50	.753	22.2	14,062	288,333	248	6,863.14	.488	20.5	17,215	289,034	2,447	5,981.73	.347	16.7	13,735	270,747	680	4,592.03	.334	19.7	21,687	175,157	318	4,775.59	.220	8.1
N.Y.	11,030	654,231	–	34,082.70	3.09	59.3	15,459	906,617	367	44,229.78	2.87	57.3	25,198	1,061,368	2,501	40,907.02	1.62	42.1	33,611	993,445	1,153	35,323.38	1.05	29.6	36,994	1,075,841	2,087	37,052.10	1.00	29.1
TOTALS	475,217	4,849,812	16,061	96,818.65	.204	10.2	870,766	7,930,028	55,074	158,609.38	.182	10.2	997,793	9,425,728	73,810	167,914.72	.168	9.4	800,893	7,206,949	59,048	133,857.10	.167	9.0	766,099	8,594,966	50,772	140,596.70	.184	11.2

STATE	Year 1927						Year 1928						Year 1929						Year 1930						Year 1931					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult		Cost	Ribes
MAINE	260,471	2,582,159	10225	22,075.46	.085	9.9	202,359	1,577,254	8,778	22,417.60	.111	7.8	234,459	2,129,942	18,244	21,953.78	.094	9.1	197,075	2,096,207	10,357	23,463.51	.119	10.6	114,544	1,286,322	4,846	18,429.69	.161	11.2
N.H.	151,985	2,176,006	2,169	31,222.55	.205	14.3	145,329	2,041,412	4,076	31,572.35	.217	14.0	155,719	1,866,554	6,178	30,961.38	.199	12.0	218,137	2,807,150	3,192	47,766.94	.219	12.9	158,004	2,891,692	4,022	46,596.31	.295	18.3
VT.	17,090	262,360	314	7,392.22	.433	15.4	14,475	147,930	144	6,020.30	.416	10.2	10,295	87,686	397	5,245.87	.510	8.5	7,245	74,039	83	4,243.45	.586	10.2	8,125	38,827	129	3,144.30	.387	4.8
MASS.	284,411	864,090	32,733	26,077.95	.092	3.0	227,058	497,963	34,146	28,519.45	.126	2.2	243,879	825,565	32226	29,827.84	.122	3.4	108,683	996,376	8072	15,294.78	.141	9.2	29,815	128,179	4,270	6,491.93	.218	4.3
R.I.	9,735	22,279	521	1,700.86	.175	2.3	21,461	17,777	615	2,629.64	.119	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CONN.	12,068	40,441	715	1,784.63	.148	3.4	73,981	98,412	1,289	6727.34	.091	1.3	28,994	127,124	9,471	7,128.74	.251	4.5	27,253	33,330	3,140	3,013.79	.111	1.2	1,510	25,776	260	730.05	.483	17.1
N.Y.	61,676	1,393,905	2,207	44,809.78	.727	22.6	85,454	1,740,941	9,411	45,570.13	.533	54.0	118,465	1,904,238	6077	58,923.31	.497	16.1	89,894	1,306,498	4,302	47,116.14	.524	14.5	118,353	1,484,224	4,956	55,433.61	.468	12.5
SUB-TOTALS N.E.-N.Y.	797,436	7,341,240	48,884	135,063.45	.169	9.2	770,117	6,121,689	58,459	143,456.81	.186	7.9	791,211	6,941,308	72,593	154,046.92	.195	8.8	648,287	7,313,600	29,146	140,898.61	.217	11.3	430,351	5,855,020	18,483	130,825.89	.304	13.6
PA.	No	Regular	Ribes	Eradication	Work	was	performed	in Penn.	prior	to 1929			5,459	329,670	561	3,756.26	.688	60.4	11,745	656,768	863	8,631.48	.735	55.9	24,016	828,958	703	9,979.18	.416	34.5
ALL STATES	797,436	7,341,240	48,884	135,063.45	.169	9.2	770,117	6,121,689	58,459	143,456.81	.186	7.9	796,670	7,270,978	73,154	157,803.18	.198	9.1	660,032	7,970,368	30,009	149,530.09	.227	12.1	454,367	6,683,978	19,186	140,805.07	.310	14.7

STATE	Year 1932						Year 1933						Totals 1922-1933					Grand Totals 1918-1933					
	Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre		Acres	No. Ribes		Total Cost	Per Acre	
		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes		Wild	Cult.		Cost	Ribes
MAINE	51,151	735,489	3569	11,981.89	.234	14.4	73135	1,885,886	4,919	37,137.52	.508	25.8	2637.565	20534.143	120,913	248,525.88	.094	7.8	2,818,195	21,192,872	122,492	268,234.02	.095	7.5
N.H.	79,924	866,528	1,066	14,704.96	.184	10.8	77,075	4,122,871	752	48,211.90	.626	53.5	2,173,192	32,251,682	79,844	467,555.90	.215	14.8	2,744,097	38,587,372	141,361	588,696.44	.215	14.1
VT.	7,476	34,525	4,060	2,361.18	.316	4.6	17,280	232,624	225	12,095.21	.700	13.5	186,188	2,068,154	10,034	80,554.76	.433	11.1	204,166	2,340,297	10,316	94,807.27	.464	11.5
MASS	13,584	106,577	967	3,196.38	.235	7.8	14,003	223,388	48	5,545.16	.396	16.0	1,703,218	10,818,462	227,700	237,832.06	.140	6.4	1,785,095	13,233,335	238,045	282,506.96	.158	7.4
R.I.	497	203	214	246.75	.496	0.4	80	129		97.07	1.21	1.6	169,998	108,956	8,030	13,501.16	.079	0.6	273,259	190,198	12,281	30,262.71	.111	0.7
CONN.	—	—	—	—	—	—	—	—	—	—	—	—	216,080	1,485,855	18,568	46,240.54	.214	6.9	229,550	1,611,118	18,576	53,610.65	.234	7.0
N.Y.	145,075	1,223,388	6198	49,370.12	.340	8.5	75,773	659,088	3,113	31,633.48	.417	8.7	816,982	14,403,784	42,372	524,451.55	.642	17.6	891,134	13,518,722	56,115	726,464.46	.815	21.9
SUB-TOTALS N.E.-N.Y.	297,707	2,966,719	16,074	81,861.28	.275	10.0	257,346	7,123,986	9,057	134,720.34	.523	27.7	7,903,223	81,671,036	507,461	1,618,669.85	.205	10.3	8,945,496	96,673,914	599,186	2,044,582.51	.229	10.8
PA.	20,212	802,027	3,342	6,064.70	.300	39.7	19,799	1,704,794	212	22,368.01	1.13	86.1	81,231	4,322,217	5,681	50,799.63	.625	53.2	81,231	4,322,217	5,681	50,799.63	625	532
ALL STATES	317,919	3,768,737	19,416	87,925.98	.277	11.9	277,145	8,828,780	9,269	157,088.35	.567	31.9	7,984,454	85,993,253	513,142	1,669,469.48	.209	10.8	9,026,727	100,996,131	604,867	2,095,382.14	.232	11.2

Includes all Ribes Eradication work performed under all programs. However, all black currant elimination and nursery sanitation projects since 1929 are excluded.

SUMMARY OF RIBES RE-ERADICATION WORK IN NORTHEASTERN STATES 1923-1933 Incl.

STATE	Year 1923						Year 1924					
	Acres Re-examined	No Ribes Wild	No Ribes Cult	Total Cost	Per Acre Cost	Per Acre Ribes	Acres Re-examined	No Ribes Wild	No Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	20	284	–	5 80	.290	14.2	1,240	17,608	–	359.60	.290	14.2
N.H.	430	6,603	–	46 82	.109	11.3	6,668	75,168	48	990.79	.149	11.3
VT.	1240	6 324	–	417 88	.337	5.1	974	4 967	–	328 24	.337	5.1
MASS.	16,943	25 414	–	1,609.59	.095	1.5	1,311	1,966	–	124.55	.095	1.5
R. I.	3 240	1.264	–	194 60	.060	0.4	5,000	2,350	–	210.00	.342	0.5
CONN.	–	–	–	–	–	–	–	–	–	–	–	–
N. Y.	–	–	–	–	–	–	–	–	–	–	–	–
SUB-TOTALS N.E. - N.Y.	21,873	39 889	–	2.274 49	104	1 8	15.193	102.059	48	2,013 18	133	6 7
PA.	–	–	–	–	–	–	–	–	–	–	–	–
ALL STATES	21,873	39,889	–	2.274 49	.104	1 8	15.193	102 059	48	2,013.18	133	6 7

STATE	Year 1925						Year 1926					
	Acres Re-examined	No. Ribes Wild	No. Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes	Acres Re-examined	No Ribes Wild	No Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	644	9.145	–	186 76	290	14 2	728	54.199	10	364.59	508	74 4
N.H.	24,008	113, 221	406	2,516.61	.105	4 7	32,046	159,488	677	4,406.89	.137	5.0
VT.	1,396	7 120	–	470 45	.337	5.1	5,850	29 835	–	1,971 45	.337	5.1
MASS.	4.256	6 384	–	404.32	.095	1.5	6,145	9,218	–	583 78	.095	1.5
R. I.	–	–	–	–	–	–	2 670	1 197	–	250.00	.094	0.5
CONN.	2.371	2.050	4	903.27	.381	0.9	570	7 669	12	286 76	.503	13 4
N. Y.	1,326	1,420	–	463.98	.350	1 1	1 079	1,499	–	77 66	072	1 4
SUB-TOTALS N.E. - N.Y.	34.001	139,340	410	4,945.39	.145	4 1	49 088	263, 105	699	7,941.13	162	5.4
PA.	–	–	–	–	–	–	–	–	–	–	–	–
ALL STATES	34.001	139,340	410	4,945.39	.145	4 1	49 088	263,105	699	7,941 13	162	5.4

STATE	Year 1927					
	Acres Re-examined	No. Ribes Wild	No. Ribes Cult	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	1,010	19 480	–	438.25	.433	19.3
N.H.	74,034	496 160	341	9,850 29	.133	6 7
VT.	2,315	18,421	–	841.73	364	7.9
MASS.	14,942	42 400	27	1,862 08	125	2 8
R. I.	–	–	–	–	–	–
CONN.	8 836	112, 384	493	6 848 57	.775	13 9
N. Y.	1 279	16, 741	–	714 18	.558	13.1
SUB-TOTALS N.E. - N.Y.	102 416	705.586	861	20.555 10	.201	6.9
PA.	–	–	–	–	–	–
ALL STATES	102 416	705.586	861	20,555.10	.201	6.9

STATE	Year 1928						Year 1929					
	Acres Re-examined	No Ribes Wild	No Ribes Cult	Total Cost	Per Acre Cost	Per Acre Ribes	Acres Re-examined	No Ribes Wild	No Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	708	18,538		180 30	255	26 2	232	34 771		234 60	1 01	149 9
N.H.	83,201	261 126	1,144	9.272 61	111	3 1	56 425	236 445	466	9 648 02	100	2.5
VT.	2 292	11 410	52	866 07	378	5 0	3,005	22,786	56	1,249 60	416	7.6
MASS.	15,875	25 437	7	1 249 81	079	1 6	23 961	16 194	655	2 658 67	127	0.8
R. I.												
CONN.	1,124	24,973	75	1 286 50	1 14	22 2	6 203	7 283	14.51	905 80	146	1.2
N. Y.	10,395	216,828	824	5 035 30	484	20 9	9 291	78.433	668	6,543 17	704	8 4
SUB-TOTALS N.E. - N.Y.	113,593	558 312	2,102	17 890 59	157	4 9	136 117	395 912	3296	21,239 86	156	2 9
PA.							–	–	–	–	–	–
ALL STATES	113,593	558 312	2,102	17 890 59	157	4 9	136, 117	395 912	3296	21,239 86	156	2 9

STATE	Year 1930						Year 1931.					
	Acres Re-examined	No Ribes Wild	No Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes	Acres Re-examined	No Ribes Wild	No Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	810	27 570	216	578.95	.715	34.0	2.165	70 096	134	1,395 09	.644	32 4
N.H.	6 733	33.080	5	829 27	.123	4 9	21.357	130 583	200	3 649 78	.171	6 1
VT.	5 877	20,572	25	1.660 26	.283	3 5	3 535	10 287	3	980 77	277	2 9
MASS.	28 108	27.995	83	2.825 55	.101	1 0	85,714	136 036	2,388	6 624 90	077	1 6
R. I.												
CONN.	2 342	10,829	455	1,227.67	.524	4.6	4.540	85.051	–	4 005 85	.882	18.7
N. Y.	8,327	25,691	169	3,014.16	.362	11 5	5. 205	18 706	67	1, 331. 05	.256	3.6
SUB-TOTALS N.E. - N.Y.	52,197	215 737	953	10,135 86	.194	4 1	122.516	450 759	2,792	17,987 44	.147	3 7
PA.	–	–	–	–	–	–	1,408	39 384	–	1,047 33	.744	28 0
ALL STATES	52,197	215.737	953	10.135.86	.194	4 1	123, 924	490,143	2,792	19034 77	154	4 0

STATE	Year 1932					
	Acres Re-examined	No. Ribes Wild	No. Ribes Cult	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	30,436	287,497	1157	7285.10	.239	9.4
N.H.	17,308	208,690	79	2 942 97	170	12 1
VT.	4 373	24 251	697	1.414.36	.323	5.5
MASS.	148 022	227 776	2 104	13 441 03	091	1.5
R. I.	5,975	5.595	75	1 418 31	237	0.9
CONN.	7 337	134 456	1,216	4.592 40	.628	18.3
N. Y.	10 822	72 265	340	4. 116 81	380	6 7
SUB-TOTALS N.E. - N.Y.	224 273	960.530	5,668	35,210.98	157	4.3
PA.	2 428	57.059	7	1.846 45	.760	23.5
ALL STATES	226,701	1.017.589	5,675	37,057 43	.163	4.5

STATE	Year 1933						Totals 1923 - 1933					
	Acres Re-examined	No Ribes Wild	No Ribes Cult	Total Cost	Per Acre Cost	Per Acre Ribes	Acres Re-examined	No. Ribes Wild	No. Ribes Cult.	Total Cost	Per Acre Cost	Per Acre Ribes
MAINE	23,047	365,433	68	6900.38	299	15.9	61,040	904 627	1,585	17.929.42	294	14.8
N.H.	21453	571 195	5	8232 92	384	26 6	383,663	2 291, 759	3.371	52,386.97	137	6.0
VT.	9,439	90 521	3	7197 06	724	9 1	40 796	246.494	836	17 398.07	427	6 0
MASS.	83.104	330. 385	2821	14 218 90	171	4 0	425. 381	849 205	8.085	45603 18	107	2 0
R. I.	5233	3.459	86	4433 53	847	0 7	22 118	13, 865	161	6, 506 24	294	0 6
CONN.	42 513	300 299	109	16 628.59	391	7.1	75 836	684.994	3 815	36 685.41	.484	9 0
N. Y.	65.550	1 268 914	283	41 450 32	632	19.4	113, 274	1 770 497	2 351	62 746 63	554	15 6
SUB-TOTALS N.E. - N.Y.	250,839	2 930 212	3375	99,061 90	395	11.7	1,122, 108	6 761. 441	20. 204	. 239 255 92	.213	6.0
PA.	24 871	991 852	51	29 477 37	1 19	39.9	28 707	1, 088. 295	58	32. 371 15	1.13	37.9
ALL STATES	275 710	3 922.064	3 426	128 539 27	466	14.2	1.150. 815	7 849 736	20, 262	271.627.07	.236	6 8

Includes all Ribes Eradication work performed under all programs However; all black currant elimination and nursery sanitation projects since 1929 are excluded

Table 33.-Status of Ribes Eradication Work in Northeastern States-December, 1933

(Initial Work)

State	Acreage of Control Area			Acreage Worked*			**Percentage of Total Control Area Worked	Acreage Still to be Worked		
	White Pine	Protection Zones	Total	White Pine	Protection Zones	Total		White Pine	Protection Zones	Total
Me.	1,781,062	2,340,209	4,121,271	1,217,460	1,600,735	2,818,195	68.4	563,602	739,474	1,303,076
N.H.	1,544,033	1,635,475	3,179,508	1,333,631	1,410,466	2,744,097	86.3	210,402	225,009	435,411
Vt.	120,782	181,172	301,954	81,666	122,500	204,166	67.6	39,116	58,672	97,788
Mass.	932,564	902,531	1,835,095	906,828	878,267	1,785,095	97.3	25,736	24,264	50,000
R.I.	73,196	200,063	273,259	73,196	200,063	273,259	100.0	0	0	0
Conn.	139,977	99,573	239,550	134,057	95,493	229,550	95.8	5,920	4,080	10,000
N.Y.	829,352	552,902	1,382,254	534,680	356,454	891,134	64.5	294,672	196,448	491,120
N.E.& N.Y.	5,420,966	5,911,925	11,332,891	4,281,518	4,663,978	8,945,496	78.9	1,139,448	1,247,947	2,387,395
N.J.	1,350	2,025	3,375	0	0	0	0	1,350	2,025	3,375
Pa.	217,998	326,997	544,995	32,492	48,739	81,231	14.9	185,506	278,258	463,764
All States	5,640,314	6,240,947	11,881,261	4,314,010	4,712,717	9,026,727	76.0	1,326,304	1,528,230	2,854,534

(Re-Eradication)

State	Acreage of Control Area			Acreage Worked*			**Percentage of Total Control Area Worked	Acreage Still to be Worked		
	White Pine	Protection Zones	Total	White Pine	Protection Zones	Total		White Pine	Protection Zones	Total
Me.	1,781,062	2,340,209	4,121,271	26,369	34,671	61,040	1.5	1,754,693	2,305,538	4,060,231
N.H.	1,544,033	1,635,475	3,179,508	186,460	197,203	383,663	12.1	1,357,573	1,438,272	2,795,845
Vt.	120,782	181,172	301,954	16,318	24,478	40,796	13.5	104,464	156,694	261,158
Mass.	932,564	902,531	1,835,095	216,094	209,287	425,381	23.2	716,470	693,244	1,409,714
R.I.	73,196	200,063	273,259	5,927	16,191	22,118	8.1	67,269	183,872	251,141
Conn.	139,977	99,573	239,550	44,288	31,548	75,836	31.7	95,689	68,025	163,714
N.Y.	829,352	552,902	1,382,254	67,964	45,310	113,274	8.2	761,388	507,592	1,268,980
N.E.& N.Y.	5,420,966	5,911,925	11,332,891	563,420	558,688	1,122,108	9.9	4,857,546	5,353,237	10,210,783
N.J.	1,350	2,025	3,375	0	0	0	0	1,350	2,025	3,375
Pa.	217,998	326,997	544,995	11,483	17,224	28,707	5.3	206,515	309,773	516,288
All States	5,640,314	6,240,947	11,881,261	574,903	575,912	1,150,815	9.7	5,065,411	5,665,035	10,730,446

*Excludes nursery sanitation projects.
**The percentages are the same when based on pine area.

Table 33.-Status of Tiber Eradication Work in Northeastern States-
December, 1943

(Initial Work)

State	Acreage of Control Area			Acreage Worked*			**Per-centage of Total Control Area Worked	Acreage Still for Work	
	White Pine Zones	Protection Zones	Total	White Pine Zones	Protection Zones	Total		White Pine Zones	Protection Zones
	1,721,052	340,205	2,061,257	457,600	1,375,616	1,833,216	89.0	263,452	685,041
	1,344,053	373,129	1,717,182	460,746	1,256,464	1,717,210	100.0	0	116,665
	1,234,078	342,375	1,576,453	410,460	1,166,000	1,576,460	100.0	0	76,453
	120,183	181,172	301,355	49,540	251,815	301,355	100.0	0	0
	942,504	108,831	1,051,335	875,040	176,295	1,051,335	100.0	0	0
	73,139	200,054	273,193	13,196	260,054	273,250	100.0	0	0
	139,117	39,513	178,630	105,054	73,576	178,630	100.0	0	0
	239,356	1,382,248	1,621,604	155,400	1,466,204	1,621,604	100.0	0	0
	4,420,345	311,929	4,732,274	3,581,000	1,151,274	4,732,274	100.0	0	0
	1,340	2,058	3,398	0	3,398	3,398	100.0	0	0
	217,093	320,944	538,037	81,297	456,740	538,037	100.0	0	0
	10,450,000	3,311,000	13,761,000	6,653,000	7,108,000	13,761,000	100.0	0	0

*Tentative forestry sanitation projects.
**The percentages are the same when based on pine area.

The control area in each state comprises the area initially cleared of Ribes (pine area and protection zones) plus the estimated acreage still in need of such work. The latter is based on township estimates made by the blister rust control agents, except in the following instances where the estimates were made by the Boston Office. The control area outside the agents' districts in Maine was estimated to include the acreage of all pure pine and mixed pine (30-79% pine in mixture) plus an additional acreage for protection zones equivalent to 30% of this pine area. In Pennsylvania and New Jersey the control area was assumed to be composed of 40% pine acreage (pure pine and mixed (21-79%) pine) and 60% protection zones. The control area in each state is considered the same size for both the initial and re-eradication work.

In all the Northeastern States, except Vermont and New York, the acreages of white pine are based on data secured during the cartographical survey. In these two states the acreages were estimated as 40% and 60%, respectively, of the control area. The following basis was used in the other states for estimating the white pine acreages in the control areas:

Connecticut - total acreage of pure and mixed (30-79%) pine.

Maine - total pine acreage in agents' districts plus acreage of pure and mixed (30-79%) pine outside agents' districts.

Massachusetts - total pine acreage excluding those towns in Suffolk, Barnstable, Essex and Middlesex Counties, where no control work is planned.

New Hampshire and Rhode Island - total pine acreage in each state (The control area in Rhode Island also includes considerable potential pine land.)

New Jersey and Pennsylvania - total acreage of pure and mixed (21-79%) white pine.

The acreages of white pine in the total area worked or re-worked were computed on the basis of their being the same proportion as the white pine in the total control area in each state.

The control area in each state comprises the area initially cleared of slash (pine area and protection zones) plus the estimated acreage still in need of such work. The latter is based on township estimates made by the district rust control agents, except in the following instances where estimates were made by the Boston Office. The control area outside the agents' districts in Maine was estimated to include the acreage of all pure pine and mixed pine (70-79% pine mixture) plus an additional acreage for protection zones equivalent to 10% of this pine area. In Pennsylvania and West Jersey the control area was assumed to be composed of 40% pine acreage (pure pine and mixed (21-79%) pine) and 60% protection zones. The control area in each state is considered the same size for both the initial and re-eradication work.

In all the Northeastern States, except Vermont and New York, the acreages of white pine are based on data secured during the cartographical survey. In these two states the acreages were estimated as 40% and 60%, respectively, of the control area. The following basis was used in the other states for estimating the white pine acreages in the control areas:

Connecticut - total acreage of pure and mixed (21-79%) pine.

Maine - total pine acreage in agents' district plus acreage of pure and mixed (70-79%) pine outside agents' districts.

Massachusetts - total pine acreage excluding those towns in Suffolk, Barnstable, Essex and Middlesex Counties, where no control work is planned.

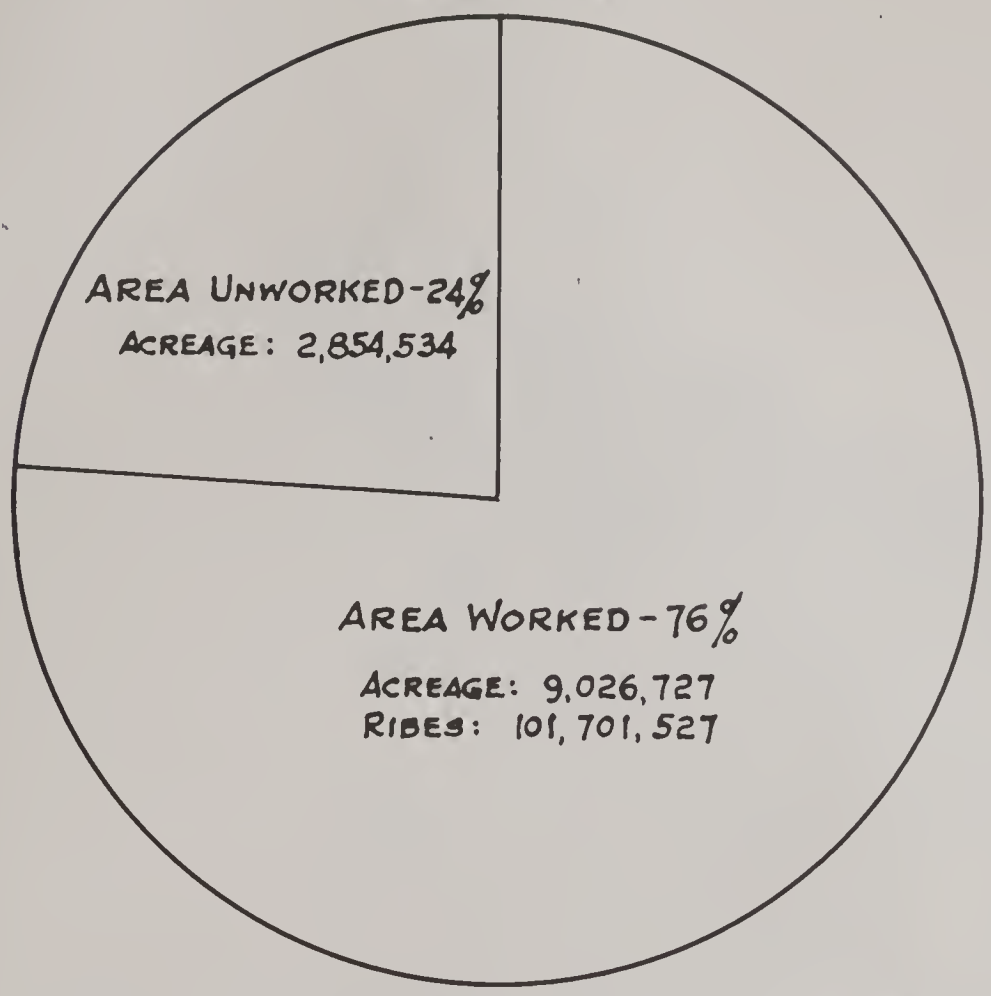
New Hampshire and Rhode Island - total pine acreage in each state (The control area in Rhode Island also includes considerable potential pine land.)

New Jersey and Pennsylvania - total acreage of pure and mixed (21-79%) white pine.

The acreages of white pine in the total area worked or re-worked were computed on the basis of their being the same proportion as the white pine in the total control area in each state.

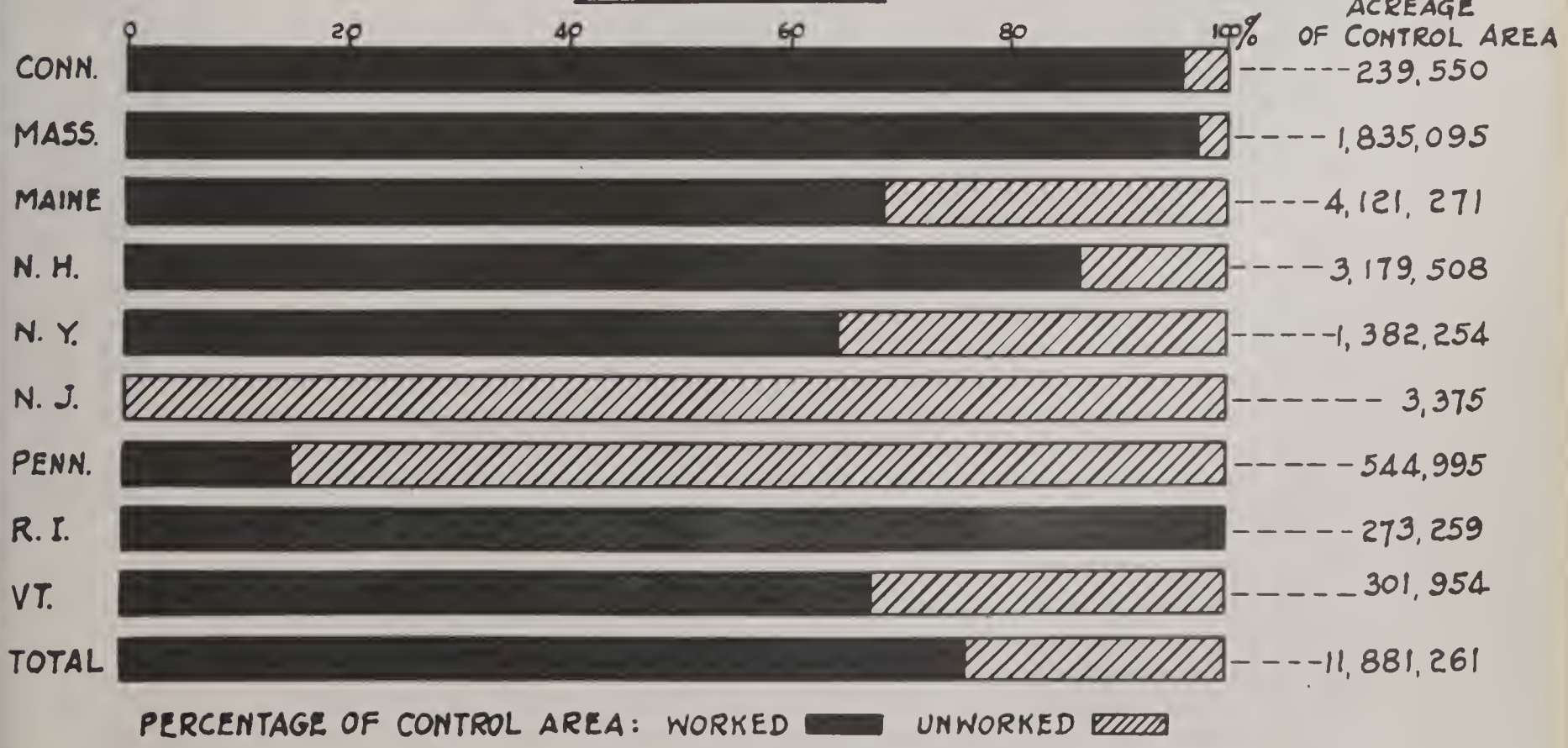
STATUS OF INITIAL RIBES ERADICATION WORK IN NORTHEASTERN STATES - 1933.

ALL STATES



TOTAL CONTROL AREA - 11,881,261 ACRES

BY STATES



STATUS OF INITIAL RIBES ERADICATION WORK IN NEW ENGLAND AND NEW YORK DECEMBER 1932

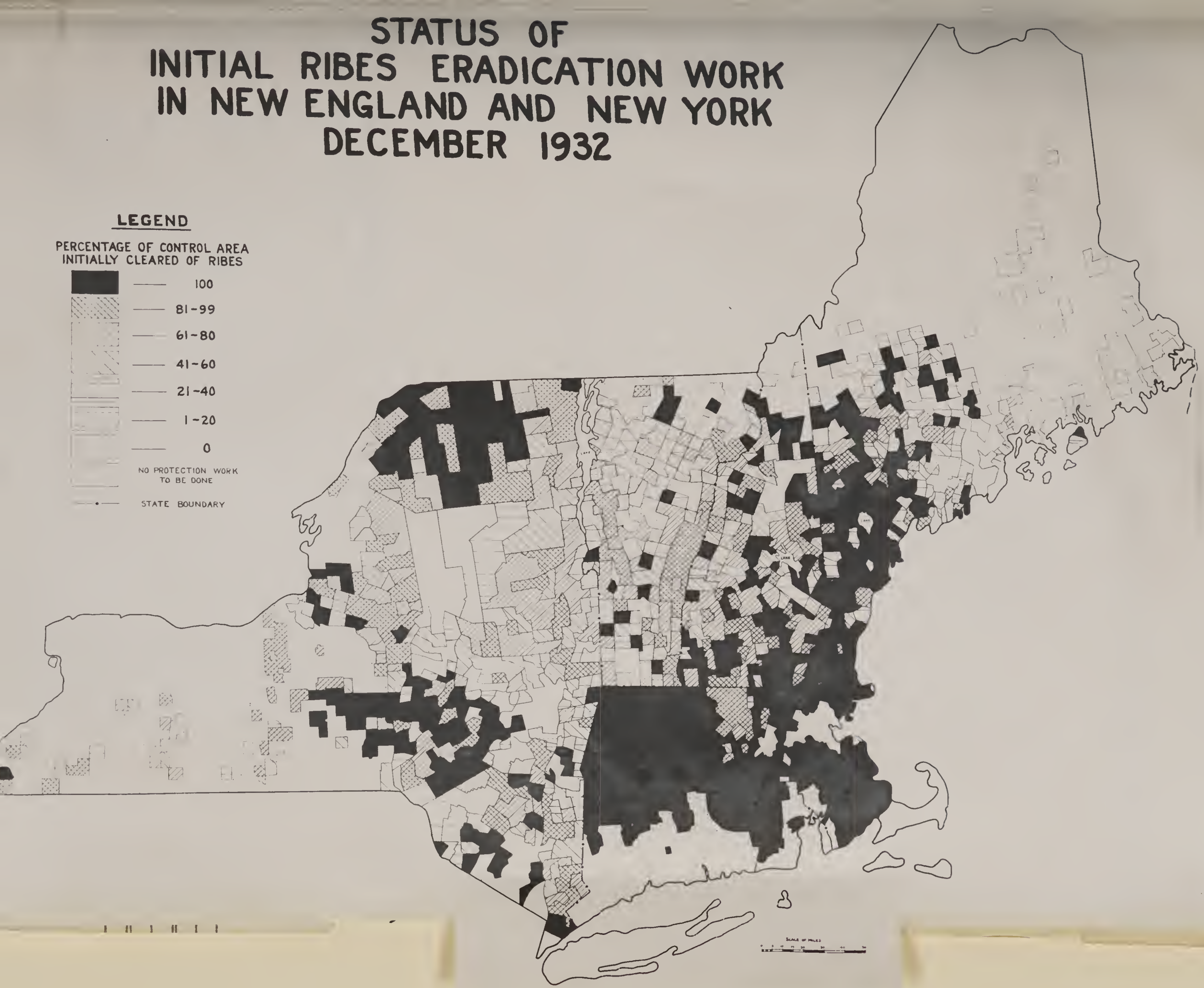
LEGEND

PERCENTAGE OF CONTROL AREA INITIALLY CLEARED OF RIBES

- 100
- 81-99
- 61-80
- 41-60
- 21-40
- 1-20
- 0

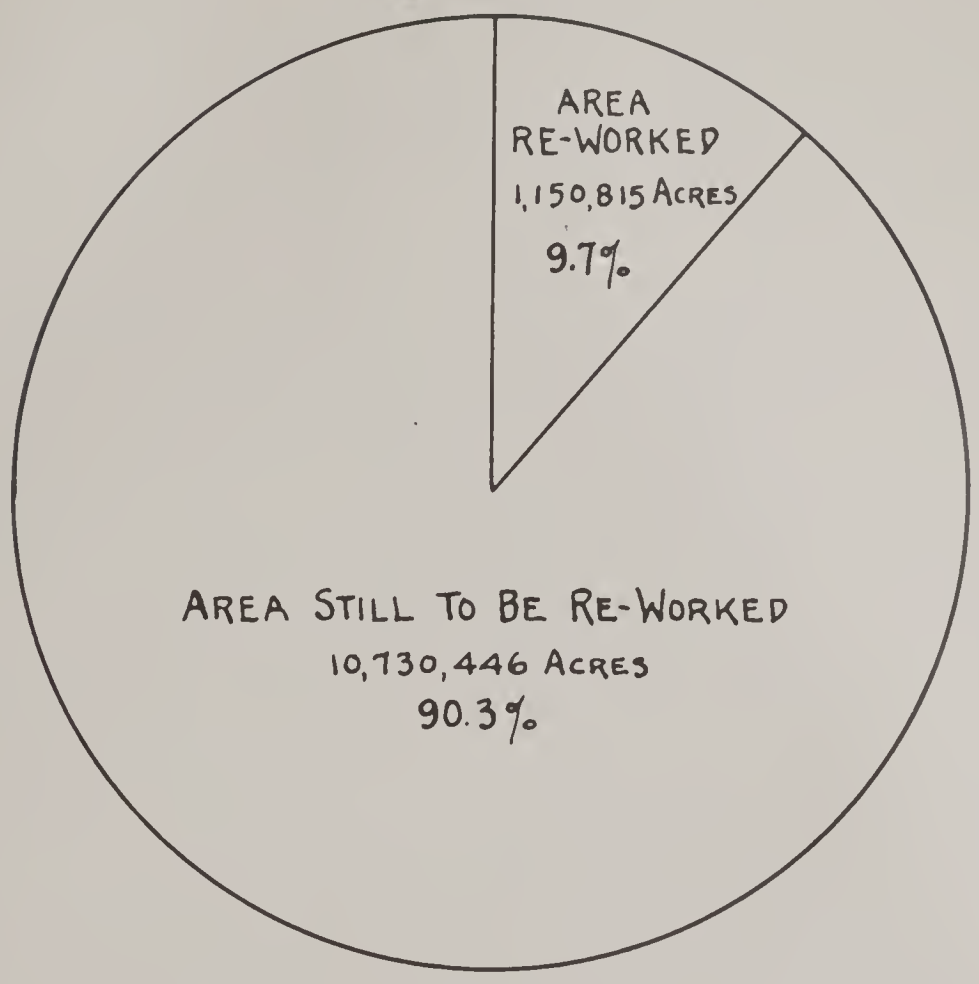
NO PROTECTION WORK TO BE DONE

STATE BOUNDARY



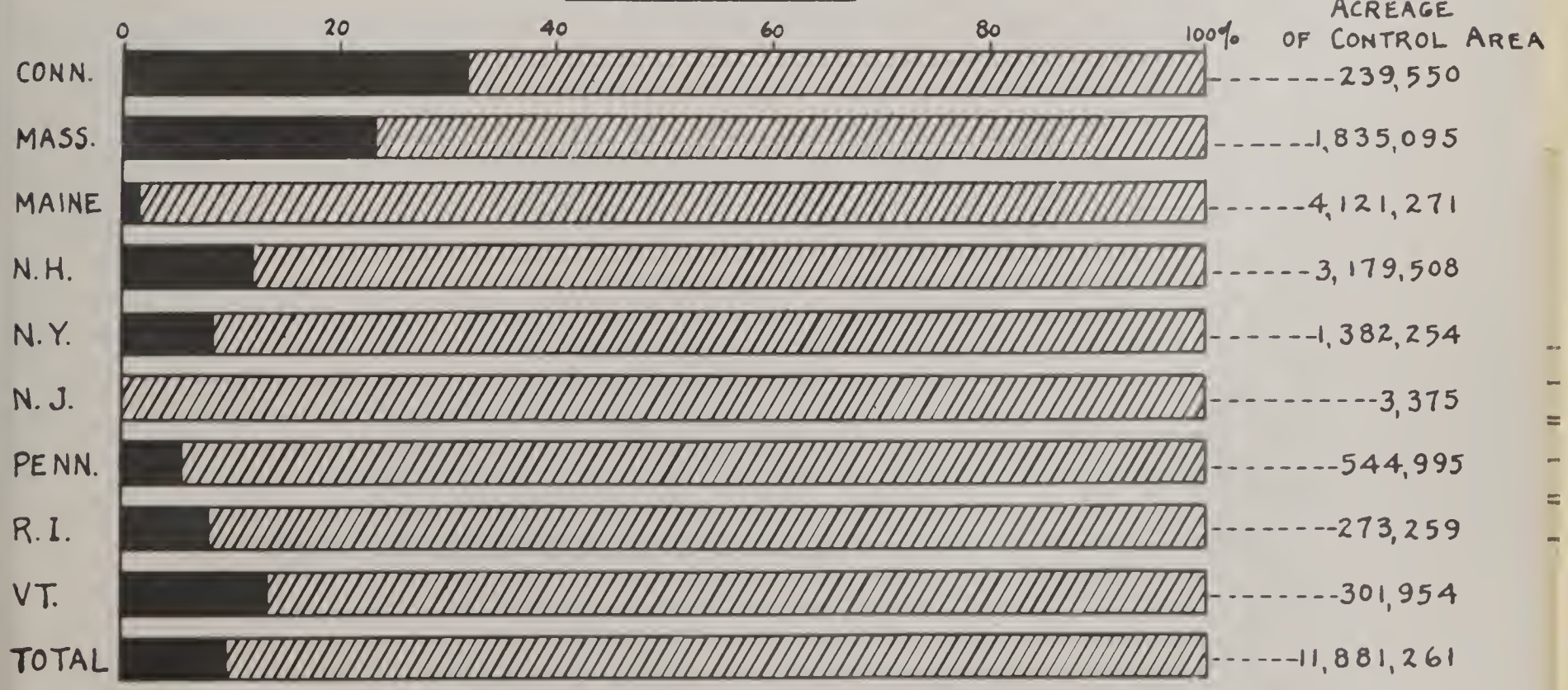
STATUS OF RIBES RE-ERADICATION WORK IN NORTHEASTERN STATES - 1933

ALL STATES



TOTAL CONTROL AREA - 11,881,261 ACRES

BY STATES



NURSERY SANITATION

White pines must be grown under absolutely sanitary conditions, as regards Ribes, in order to prevent infection from blister rust. Therefore, it is essential that the white pine stock in each nursery be protected by eradicating all Ribes within 1500 feet and all European black currants from within one mile. All of the Northeastern States, except Rhode Island, have state nurseries growing white pines. Control of the disease has been established and is being maintained in all of these nurseries. Most of the commercial pine growing nurseries are located in Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania. In the other Northeastern States there are only a few such nurseries producing white pines. Sanitation zones have been established around most of the important commercial nurseries in New England. Control work around the private nurseries in New York has been limited due to the relatively few white pines grown and the abundance of cultivated Ribes within the prescribed sanitation zones which would necessitate a large expenditure by the nurserymen for compensation if these bushes were removed. According to the present state blister rust law in New York, effective February 17, 1930, no compensation shall be paid by the state for any species of Ribes destroyed in connection with the establishment of Ribes-free zones around commercial nurseries, but fair compensation must be paid for such bushes by the person owning or operating the protected nursery. None of the commercial nurseries growing white pine in New Jersey have established sanitation zones. In Pennsylvania only two commercial nurseries have taken such action. However, in both states an effort is being made to extend protection to the most important of these nurseries.

Since 1929, a separate record has been kept of the Ribes eradication work performed in connection with the protection of the white pines in the nurseries. Prior to 1930, such control work was included in the regular Ribes eradication summaries.

Special nursery sanitation work in connection with the Regular Cooperative Control Program was performed during 1933 in all of the Northeastern States, except Vermont. Initial control was established around one state nursery and 3 privately owned nurseries, while the environs of 15 state and 21 private nurseries were re-examined for Ribes. A total of 52,382 wild Ribes and 400 cultivated bushes were removed from the 20,225 acres covered in connection with this nursery sanitation work. In addition, three nurseries were protected under the Emergency Programs.

Table 34.-Summary of Nursery Sanitation Work Conducted Under Regular Cooperative Program in Northeastern States - 1933

State	Type of Erad.	No. Nurseries Worked	Acreage Examined	Ribes Pulled Wild	Ribes Pulled Cult.	Total Man Hours	Cost Indiv.	Cost Town	Cost State	Cost Gov't.	Cost Total	Per Acre Cost	Per Acre Ribes
Me.	Initial	-	-	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	2	242	8,662	-	735	-	148.45	78.40	-	226.85	.937	35.8
	Total	2	242	8,662	-	735	-	148.45	78.40	-	226.85	.937	35.8
N.H.	Initial	-	-	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	2	431	157	-	254	19.20	-	92.35	-	111.55	.259	.36
	Total	2	431	157	-	254	19.20	-	92.35	-	111.55	.259	.36
Mass.	Initial	1	435	6,171	32	332	59.40	-	131.25	-	190.65	.438	14.2
	Re-Erad.	6	1,627	2,593	130	916	89.20	-	704.51	-	793.71	.488	1.6
	Total	7	2,062	8,764	162	1248	148.60	-	835.76	-	984.36	.477	4.3
R.I.	Initial	-	-	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	6	2,020	4,440	107	437½	-	-	445.06	-	445.06	.220	2.2
	Total	6	2,020	4,440	107	437½	-	-	445.06	-	445.06	.220	2.2
Conn.	Initial	-	-	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	8	2,840	1,742	3	2274	-	-	934.00	233.04	1,167.04	.411	.61
	Total	8	2,840	1,742	3	2274	-	-	934.00	233.04	1,167.04	.411	.61
N.Y.	Initial	1	55	12,880	-	159	-	-	65.70	-	65.70	1.19	234.2
	Re-Erad.	8	9,943	10,309	128	4619	75.10	-	1911.82	-	1,986.92	.199	1.01
	Total	9	9,998	23,189	128	4778	75.10	-	1977.52	-	2,052.62	.205	2.32
N.E. and N.Y.	Initial	2	490	19,051	32	491	59.40	-	196.95	-	256.35	.523	38.9
	Re-Erad.	32	17,103	27,903	368	9235½	183.50	148.45	4166.14	233.04	4,731.13	.277	1.6
	Total	34	17,593	46,954	400	9726½	242.90	148.45	4363.09	233.04	4,987.48	.283	2.7
N.J.	Initial	-	-	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	1	1,000	175	-	44	-	-	21.87	22.50	44.37	.044	.18
	Total	1	1,000	175	-	44	-	-	21.87	22.50	44.37	.044	.18
Pa.	Initial	2	1,000	51	-	48½	-	-	-	36.80	36.80	.034	.05
	Re-Erad.	3	632	5,202	-	1259½	-	-	420.73	-	420.73	.666	8.23
	Total	5	1,632	5,253	-	1308	-	-	420.73	36.80	457.53	.280	3.22
All States	Initial	4	1,490	19,102	32	539½	59.40	-	196.95	36.80	293.15	.197	12.8
	Re-Erad.	36	18,735	33,280	368	10539	183.50	148.45	4608.74	255.54	5,196.23	.277	1.8
	Total	40	20,225	52,382	400	11078½	242.90	148.45	4805.69	292.34	5,489.38	.271	2.6

Table 35.-Summary of Nursery Sanitation Work Conducted Under E.C.W. Program in Northeastern States - 1933
(All Re-Eradication Work in State Nurseries)

State	No. Nurseries	Acreage	Ribes Pulled Wild	Ribes Pulled Cult.	Total Man Hours	Total Cost	Per Acre Cost	Per Acre Ribes
Conn.	1	237	690	-	2,338	519.45	2.19	2.9
Pa.	1	90	2,673	-	992	189.95	2.11	29.7
Totals	2	327	3,363	-	3,330	709.40	2.17	10.3

Cost based on $1.35 per 8 hour man day.

Table 34.--Summary of Nursery Sanitation Work Conducted
Under Regular Cooperative Program in Northeastern States - 1933

State	Type of Trad.	No. Nurseries Worked	Average Tu-ssinated	Ribes Pulled Pulled	Ribes Pulled Quit.	Total Man Hours	Cost Indiv.	Cost Town	Cost State	Cost U.S.	Cost Total
Conn.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	2	2,452	6,592	-	735	-	148.45	78.40	-	298.85
	Total	2	2,452	6,592	-	735	-	148.45	78.40	-	298.85
Me.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	2	4,31	107	-	254	19.20	-	92.35	-	111.55
	Total	2	4,31	107	-	254	19.20	-	92.35	-	111.55
Mass.	Initial	1	4,45	6,171	32	732	-	-	34.40	-	34.40
	Re-Trad.	6	1,067	5,593	170	916	19.20	-	104.81	-	124.01
	Total	7	2,068	5,704	182	1648	19.20	-	139.21	-	158.41
N.H.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	6	2,020	4,440	107	4372	-	-	243.60	-	243.60
	Total	6	2,020	4,440	107	4372	-	-	243.60	-	243.60
R.I.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	8	2,840	1,742	3	2274	-	-	124.70	1,161.04	1,285.74
	Total	8	2,840	1,742	3	2274	-	-	124.70	1,161.04	1,285.74
Vt.	Initial	1	55	12,880	-	129	-	-	65.70	-	65.70
	Re-Trad.	6	2,404	10,709	128	4629	75.10	-	231.85	-	1,986.95
	Total	7	3,958	23,589	128	4758	75.10	-	297.55	-	2,052.65
Ala.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	2	4,90	19,031	12	490	53.40	-	25.05	-	78.45
	Total	2	4,90	19,031	12	490	53.40	-	25.05	-	78.45
Ark.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	16	17,103	27,902	356	2274	183.50	148.45	223.04	4,727.17	5,281.16
	Total	34	17,523	40,293	400	9758	248.90	148.45	4523.09	4,727.17	9,646.61
Fla.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Trad.	1	1,000	175	-	44	-	-	23.65	82.50	106.15
	Total	1	1,000	175	-	44	-	-	23.65	82.50	106.15
Miss.	Initial	2	1,000	51	-	44	-	-	-	30.80	30.80
	Re-Trad.	3	652	5,202	-	1272	-	-	460.75	-	460.75
	Total	5	1,652	5,253	-	1708	-	-	460.75	30.80	491.55
Ky.	Initial	4	1,490	1,102	12	2344	29.40	-	120.05	36.00	293.45
	Re-Trad.	36	23,280	10232	368	1843.50	143.45	4806.74	2253.81	5,106.82	12,310.52
	Total	40	20,225	52,352	400	21078	248.45	4805.04	2252.31	5,469.32	12,803.97

Table 35.--Summary of Nursery Sanitation Work Conducted
Under F.C.W. Program in Northeastern States - 1933
(All Re-Tradication Work in State Nurseries)

State	No. Nurseries	Average	Ribes Pulled Pulled	Ribes Pulled Quit.	Total Man Hours	For Adre Cost	For Adre Ribes
Conn.	1	2,37	950	-	519.45	2.19	2.3
Me.	1	90	2,625	-	189.95	2.11	21.1
Total	2	327	3,363	-	709.40	2.17	10.3

Cost based on $1.35 per 8 hour man day.

N.R.A. - Nursery Sanitation Work

Initial control was established around the State Welfare nursery in Pennsylvania with a crew paid from N.R.A. funds. This project, requiring 509 man hours labor, resulted in 2,540 wild Ribes being cleared from 84 acres at a total cost of $264.55.

Table 36.- Summary of All Nursery Sanitation Work in Northeastern States, 1930 - 1933, Inclusive

(By Years)

Year	Type of Erad.	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
1930	Initial	4,973	110,704	182	528.77	-	905.19	-	1,433.96	.288	22.3
	Re-Erad.	20,752	59,542	643	568.89	-	4,198.33	-	4,767.22	.230	2.9
	Total	25,725	170,246	825	1,097.66	-	5,103.52	-	6,201.18	.241	6.6
1931	Initial	3,048	6,117	55	5.60	-	240.36	139.92	385.88	.127	2.0
	Re-Erad.	26,776	26,126	1,086	117.69	-	4,863.42	372.50	5,353.61	.200	1.0
	Total	29,824	32,243	1,141	123.29	-	5,103.78	512.42	5,739.49	.192	1.1
1932	Initial	5,159	16,478	1,222	50.65	-	1,588.32	172.87	1,811.84	.351	3.2
	Re-Erad.	12,903	12,543	60	155.51	7.73	3,828.15	5.33	3,996.72	.313	0.97
	Total	18,062	29,021	1,282	206.16	7.73	5,416.47	178.20	5,808.56	.324	1.6
1933	Initial	1,574	21,642	32	59.40	-	196.95	301.35	557.70	.354	13.7
	Re-Erad.	19,062	36,643	368	183.50	148.45	4,608.74	964.94	5,905.63	.310	1.9
	Total	20,636	58,285	400	242.90	148.45	4,805.69	1,266.29	6,463.33	.313	2.8
Totals	Initial	14,754	154,941	1,491	644.42	-	2,930.82	614.14	4,189.38	.284	10.5
	Re-Erad.	79,493	134,854	2,157	1,025.59	156.18	17,498.64	1,342.77	20,023.18	.252	1.7
	Total	94,247	289,795	3,648	1,670.01	156.18	20,429.46	1,956.91	24,212.56	.257	3.1

I.J.4. - Forestry Sanitation Work

Initial control was established around the State Welfare Nursery in Pennsylvania with a crew paid from N.R.A. funds. This project, requiring 509 man hours labor, resulted in 2,540 wild vines being cleared from 64 acres at a total cost of $254.55.

Table 36.- Summary of All Forestry Sanitation Work in Northeastern States, 1930 - 1933, Inclusive

(By Years)

Year	Type of Treatment	Acreage Treated	Trees Killed	Cost				
				Initial	Re-Treat.	Over-head	Over-head	Total
1930	Initial	4,972	110,704	184	523.77	-	903.19	1,427.96
	Re-Treat.	20,192	79,442	942	538.84	-	4,126.43	4,665.27
	Total	25,164	190,246	1,126	1,062.61	-	5,029.62	6,092.23
1931	Initial	3,048	6,117	45	3.00	-	240.40	243.40
	Re-Treat.	25,115	25,135	1,054	117.03	-	1,853.42	1,970.45
	Total	28,163	31,252	1,099	120.03	-	2,093.82	2,213.85
1932	Initial	10,748	1,225	538	1.00	-	1,329.87	1,330.87
	Re-Treat.	12,927	10,342	50	1.75	-	1,558.45	1,560.20
	Total	23,675	11,567	588	2.75	-	2,888.32	2,891.07
1933	Initial	1,574	24,082	52	59.40	-	90.36	149.76
	Re-Treat.	14,036	103	408	4,504.43	-	1,664.24	6,168.67
	Total	15,610	24,185	460	4,563.83	-	1,754.60	6,318.43
Grand Total	Initial	20,342	142,368	819	586.17	-	2,664.24	3,250.41
	Re-Treat.	72,273	115,022	2,454	5,165.05	-	8,625.76	13,790.81
	Total	92,615	257,390	3,273	5,751.22	-	11,290.00	17,041.22

Table 37.-Summary of All Nursery Sanitation Work in Northeastern States, 1930 - 1933, Inclusive

(By States)

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	Indiv.	Town	State	Gov't.	Total	Cost	Ribes
Me.	Initial	206	103,516	22	324.45	-	198.20	-	522.65	2.54	502.5
	Re-Erad.	272	8,873	-	-	156.18	82.27	-	238.45	.877	32.6
	Total	478	112,389	22	324.45	156.18	280.47	-	761.10	1.59	235.1
N.H.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	1,077	7,502	-	172.28	-	140.71	-	312.99	.291	7.0
	Total	1,077	7,502	-	172.28	-	140.71	-	312.99	.291	7.0
Vt.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	450	1,540	-	-	-	303.54	-	303.54	.675	3.4
	Total	450	1,540	-	-	-	303.54	-	303.54	.675	3.4
Mass.	Initial	682	7,567	112	110.05	-	212.79	10.00	332.84	.488	11.1
	Re-Erad.	3,439	2,829	179	89.20	-	2,103.61	-	2,192.81	.638	0.8
	Total	4,121	10,396	291	199.25	-	2,316.40	10.00	2,525.65	.613	2.5
R.I.	Initial	1,190	133	520	-	-	343.56	162.87	506.43	.426	0.1
	Re-Erad.	2,020	4,440	107	-	-	445.06	-	445.06	.220	2.2
	Total	3,210	4,573	627	-	-	788.62	162.87	951.49	.296	1.4
Conn.	Initial	6,587	5,352	102	204.32	-	345.69	139.92	689.93	.105	0.8
	Re-Erad.	32,590	6,234	837	557.04	-	2,483.33	1130.32	4,170.69	.128	.19
	Total	39,177	11,586	939	761.36	-	2,829.02	1270.24	4,860.62	.124	0.3
N.Y.	Initial	3,110	26,017	634	5.60	-	1,219.95	-	1,225.55	.394	8.4
	Re-Erad.	36,762	82,259	1034	207.07	-	10,862.41	-	11,069.48	.301	2.2
	Total	39,872	108,276	1668	212.67	-	12,082.36	-	12,295.03	.308	2.7
N.E. and N.Y.	Initial	11,775	142,585	1390	644.42	-	2,320.19	312.79	3,277.40	.278	12.1
	Re-Erad.	76,610	113,677	2157	1025.59	156.18	16,420.93	1130.32	18,733.02	.245	1.5
	Total	88,385	256,262	3547	1670.01	156.18	18,741.12	1443.11	22,010.42	.249	2.9
N.J.	Initial	1,000	462	49	-	-	22.20	-	22.20	.022	.05
	Re-Erad.	1,000	175	-	-	-	21.87	22.50	44.37	.044	.18
	Total	2,000	637	49	-	-	44.07	22.50	66.57	.033	.32
Pa.	Initial	1,979	11,894	52	-	-	588.43	301.35	889.78	.450	6.0
	Re-Erad.	1,883	21,002	-	-	-	1,055.84	189.95	1,245.79	.662	11.2
	Total	3,862	32,896	52	-	-	1,644.27	491.30	2,135.57	.553	8.5
All States	Initial	14,754	154,941	1491	644.42	-	2,930.82	614.14	4,189.38	.284	10.5
	Re-Erad.	79,493	134,854	2157	1025.59	156.18	17,498.64	1342.77	20,023.18	.252	1.7
	Total	94,247	289,795	3648	1670.01	156.18	20,429.46	1956.91	24,212.56	.257	3.1

Table 37.-Summary of All Mineral Exploration Work in Northwestern States, 1950 - 1957, Inclusive

(By States)

	Type of Prod.	Acreage Sampled	Holes Drilled Well	Holes Drilled Unit	Cost Indiv.	Cost Joint	Cost State	Cost Total
	Initial	205	107,510	25	34,465	-	1,170	142,945
Idaho	Re-Treat.	272	3,815	-	-	-	852.27	4,667.27
	Total	478	111,325	25	34,465	-	2,022.27	147,612.27
	Initial	-	-	-	-	-	-	-
Montana	Re-Treat.	1,077	1,502	-	172.28	-	140.71	312.99
	Total	1,077	1,502	-	172.28	-	140.71	312.99
	Initial	-	-	-	-	-	-	-
Nevada	Re-Treat.	440	1,340	-	-	-	307.44	703.44
	Total	440	1,340	-	-	-	307.44	703.44
	Initial	852	1,367	112	110.05	-	315.13	736.18
Oregon	Re-Treat.	3,439	1,869	179	60.10	-	2,101.21	5,129.31
	Total	4,291	3,236	291	170.15	-	2,416.34	5,865.49
	Initial	1,241	10,460	691	139.35	10.00	3,710.40	14,350.75
Utah	Re-Treat.	7,970	11,460	680	150.15	-	3,585.31	15,385.46
	Total	9,211	21,920	1,371	289.50	10.00	7,295.71	29,736.21
	Initial	3,210	4,410	247	57.00	-	1,364.70	5,831.70
Wyoming	Re-Treat.	2,030	4,810	107	64.10	-	1,534.06	6,556.16
	Total	5,240	9,220	354	121.10	-	2,898.76	12,387.86
	Initial	2,917	15,237	1,075	201.37	-	4,819.80	20,594.17
Colum.	Re-Treat.	7,390	9,444	371	87.45	-	2,093.35	11,704.80
	Total	10,307	24,681	1,446	288.82	-	6,913.15	32,298.97
	Initial	1,210	2,017	142	26.64	-	637.80	2,681.44
N.M.	Re-Treat.	3,742	8,252	1,047	207.27	-	4,962.93	13,422.20
	Total	4,952	10,269	1,189	233.91	-	5,600.73	16,103.64
	Initial	4,360	7,920	1,035	182.92	-	4,378.80	12,480.72
Ariz.	Re-Treat.	7,510	14,760	1,705	337.47	-	8,078.97	23,177.44
	Total	11,870	22,680	2,740	520.39	-	12,457.77	35,658.16
	Initial	1,400	4,200	440	77.00	-	1,843.40	5,320.40
Calif.	Re-Treat.	1,040	1,560	164	28.60	-	684.76	1,977.36
	Total	2,440	5,760	604	105.60	-	2,528.16	7,297.76
	Initial	1,500	2,250	236	41.25	-	987.75	2,851.00
Wash.	Re-Treat.	1,000	1,500	158	27.50	-	658.50	1,901.00
	Total	2,500	3,750	394	68.75	-	1,646.25	4,752.00
	Initial	15,305	154,361	16,189	2,833.18	10.00	67,824.54	195,826.72
All	Re-Treat.	25,686	57,937	6,076	1,062.59	-	25,439.82	73,439.41
	Total	40,991	212,298	22,265	3,895.77	10.00	93,264.36	269,266.13

As previously mentioned, no separate record was kept of the nursery sanitation work prior to 1930. Such control work was included in the regular Ribes eradication summaries. However, an incomplete summary was secured from the state leaders (based on available data and including estimates in several instances) for the period 1925 - 1929.

Table 38.-Summary of All Nursery Sanitation Work in Northeastern States 1925 - 1929

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
Me.	Initial	415	91,569	-	617.10	-	-	-	617.10	1.49	220.6
	Re-Erad.	400	1,343	-	74.20	10.80	-	-	85.00	.213	3.4
	Total	815	92,912	-	691.30	10.80	-	-	702.10	.861	114.0
N.H.	Initial	115	29	-	-	-	16.56	-	16.56	.144	0.3
	Re-Erad.	805	3,351	45	245.65	-	161.97	-	407.62	.506	4.2
	Total	920	3,380	45	245.65	-	178.53	-	424.18	.461	3.7
Vt.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	700	5	-	-	-	479.64	-	479.64	.685	.001
	Total	700	5	-	-	-	479.64	-	479.64	.685	.001
Mass.	Initial	10,825	5,641	4,488	-	-	7,759.85	-	7,759.85	.717	0.5
	Re-Erad.	4,625	21	648	-	-	918.90	-	918.90	.199	.004
	Total	15,450	5,662	5,136	-	-	8,678.75	-	8,678.75	.562	0.4
Conn.	Initial	5,342	159	1,836	242.75	-	769.71	-	1,012.46	.190	.03
	Re-Erad.	5,580	1,083	1,431	72.00	-	547.90	75.00	694.90	.125	0.2
	Total	10,922	1,242	3,267	314.75	-	1,317.61	75.00	1,707.36	.156	0.1
N.Y.	Initial	8,762	41,795	-	-	-	1,939.94	-	1,939.94	.221	4.8
	Re-Erad.	9,020	97,047	294	-	-	4,795.28	-	4,795.28	.532	10.8
	Total	17,782	138,842	294	-	-	6,735.22	-	6,735.22	.379	7.8
Totals	Initial	25,459	139,193	6,324	859.85	-	10,486.06	-	11,345.91	.446	5.5
	Re-Erad.	21,130	102,850	2,418	391.85	10.80	6,903.69	75.00	7,381.34	.349	4.9
	Total	46,589	242,043	8,742	1,251.70	10.80	17,389.75	75.00	18,727.25	.402	5.2

No nursery sanitation work performed in Northeastern States not listed above.

Table 39.-Summary of All Nursery Sanitation Work in Northeastern States 1925 - 1933, Inclusive

State	Type of Erad.	Acreage Examined	Ribes Pulled		Cost					Per Acre	
			Wild	Cult.	Indiv.	Towns	State	Gov't.	Total	Cost	Ribes
Me.	Initial	621	195,085	22	941.55	-	198.20	-	1,139.75	1.84	314.1
	Re-Erad.	672	10,216	-	74.20	166.98	72.27	-	323.45	.481	15.2
	Total	1,293	205,301	22	1015.75	166.98	280.47	-	1,463.20	1.132	158.8
N.H.	Initial	115	29	-	-	-	16.56	-	16.56	.144	0.3
	Re-Erad.	1,882	10,853	45	417.93	-	302.68	-	720.61	.383	5.8
	Total	1,997	10,882	45	417.93	-	319.24	-	737.17	.369	5.5
Vt.	Initial	-	-	-	-	-	-	-	-	-	-
	Re-Erad.	1,150	1,545	-	-	-	783.18	-	783.18	.681	1.3
	Total	1,150	1,545	-	-	-	783.18	-	783.18	.681	1.3
Mass.	Initial	11,507	13,208	4,600	110.05	-	7,972.64	10.00	8,092.69	.703	1.2
	Re-Erad.	8,064	2,850	827	89.20	-	3,022.51	-	3,111.71	.386	0.4
	Total	19,571	16,058	5,427	199.25	-	10,995.15	10.00	11,204.40	.573	0.8
R.I.	Initial	1,190	133	520	-	-	343.56	162.87	506.43	.426	0.1
	Re-Erad.	2,020	4,440	107	-	-	445.06	-	445.06	.220	2.2
	Total	3,210	4,573	627	-	-	788.62	162.87	951.49	.296	1.4
Conn.	Initial	11,929	5,511	1,938	447.07	-	1,115.40	139.92	1,702.39	.143	0.5
	Re-Erad.	38,170	7,317	2,268	629.04	-	3,031.23	1205.32	4,865.59	.127	.19
	Total	50,099	12,828	4,206	1076.11	-	4,146.63	1345.24	6,567.98	.131	.26
N.Y.	Initial	11,872	67,812	634	5.60	-	3,159.89	-	3,165.49	.267	5.7
	Re-Erad.	45,782	179,306	1,328	207.07	-	15,657.69	-	15,864.76	.347	3.9
	Total	57,654	247,118	1,962	212.67	-	18,817.58	-	19,030.25	.330	4.3
N.E. and N.Y.	Initial	37,234	281,778	7,714	1504.27	-	12,806.25	312.79	14,623.31	.393	7.6
	Re-Erad.	97,740	216,527	4,575	1417.44	166.98	23,324.62	1205.32	26,114.36	.267	2.2
	Total	134,974	498,305	12,289	2921.71	166.98	36,130.87	1518.11	40,737.67	.302	3.7
N.J.	Initial	1,000	462	49	-	-	22.20	-	22.20	.022	0.5
	Re-Erad.	1,000	175	-	-	-	21.87	22.50	44.37	.044	.18
	Total	2,000	637	49	-	-	44.07	22.50	66.57	.033	.32
Pa.	Initial	1,979	11,894	52	-	-	588.43	301.35	889.78	.450	6.0
	Re-Erad.	1,883	21,002	-	-	-	1,055.84	189.95	1,245.79	.662	11.2
	Total	3,862	32,896	52	-	-	1,644.27	491.30	2,135.57	.553	8.4
All States	Initial	40,213	294,134	7,815	1504.27	-	13,416.88	614.14	15,535.29	.386	7.3
	Re-Erad.	100,623	237,704	4,575	1417.44	166.98	24,402.33	1417.77	27,404.52	.272	2.4
	Total	140,836	531,838	12,390	2921.71	166.98	37,819.21	2031.91	42,939.81	.305	3.8

Table 39.--Summary of All Mercury Sanitation Work in Northeastern States
1925 - 1933, Inclusive

Type of Operation	Acreage Treated	Type Mulled Unit.	Wild	Indiv.	Towns	State	Govt.	Total
Initial	621	21	1	345.55	-	195.20	-	1,134.75
Re-Treat.	615	-	10,210	74.20	100.34	72.27	-	327.47
Total	1,293	22	801, 301	1,715.	100.14	280.47	-	1,403.20
Initial	113	-	23	-	-	15.35	-	10.50
Re-Treat.	1,812	45	10,851	-	417.07	208.08	-	750.01
Total	1,927	45	10,872	-	417.37	219.24	-	727.17
Initial	-	-	-	-	-	-	-	-
Re-Treat.	1,120	-	1,245	-	-	123.18	-	168.10
Total	1,120	-	1,245	-	-	123.18	-	123.18
Initial	11,207	-	13,205	4,800	17.05	1,912.64	10.00	3,020.09
Re-Treat.	8,040	821	8,210	-	85.20	3,022.41	-	3,111.
Total	19,251	-	16,056	5,421	142.25	10,935.15	10.00	11,204.40
Initial	1,100	-	175	250	-	7.	-	132.87
Re-Treat.	2,010	-	4,210	1,040	-	1,115.07	-	1,134.70
Total	3,110	-	4,385	1,290	-	1,122.07	-	1,267.57
Initial	2,000	-	1,200	-	-	35.50	-	35.50
Re-Treat.	1,000	-	1,715	-	-	21.87	25.50	111.37
Total	3,000	-	5,217	-	-	44.07	25.50	55.57
Initial	1,219	-	11,204	-	-	505.42	101.33	589.18
Re-Treat.	1,854	-	21,002	-	-	1,058.84	129.95	1,245.13
Total	3,183	-	32,206	-	-	1,564.26	231.28	1,835.31
Initial	40,213	-	1,814	1,804.27	-	1,616.66	213.44	1,830.10
Re-Treat.	1,000,653	27,104	4,515	1,417.07	1,105.94	1,102.73	1,117.11	1,204.40
Total	1,140,835	12,390	25,241	1,221.34	1,100.34	2,011.91	1,332.54	1,035.41

Table 40.- Status of Nursery Sanitation Work - December 1933

State	No. Nurseries Growing White Pine				No. Nurseries Protected from Blister Rust			
	Reforestation Stock Only	Ornamental Stock Only	Both	Total	Reforestation Stock Only	Ornamental Stock Only	Both	Total
Me.	2	3	5	10	2	1	3(a)	6
N.H.	1	2	2	5	1	2	2	5
Vt.	1	2	-	3	1	-	-	1
Mass.	6	15	4	25	6	11	3	20
R.I.	-	11	-	11	-	6	-	6
Conn.	1	8	6	15	1	4(b)	4(c)	9
N.Y.	7	262	1	270	7	-	1	8
N.E.& N.Y.	18	303	18	339	18	24	13	55
N.J.	1	86	-	87	1	-	-	1
Pa.	4	100 est.	-	104	4	2	-	6
Total	23	489	18	530	23	26	13	62

(a) The two unprotected private nurseries growing white pine for both reforestation and ornamental purposes are no longer of importance from a control viewpoint. The one at Skowhegan, Me. has gone out of business and the planting stock is too large for reforestation; while the other, located at Cupsuptic and orned by the Brown Company is discontinuing the growing of white pine. The existing stock in this latter nursery will be planted locally on lands owned by the company.

(b) Three additional nurseries established sanitation zones, but abandoned them.

(c) One additional nursery established a sanitation zone, but abandoned it.

The number of private nurseries in Connecticut includes only those having 500 or more white pines; while in Massachusetts only the larger commercial white pine growing nurseries are listed. In the other states, the number includes all nurseries growing white pines regardless of the amount of such stock. In Rhode Island there are only 3 private nurseries with more than 500 white pines; 6 of the other nurseries in this state and the two in Vermont each contain less than 100 white pines. Only 28 private nurseries in New Jersey have over 500 such trees. The 263 private pine growing nurseries in New York contained 364,544 white pines in 1932. Of this total number of trees, 207,700 were located in three nurseries (Hicks, VonKleaf, and United Forestry Company). Only 58 of the private nurseries in this state were growing 500 or more white pines and only 10 had 5,000 or more of this species.

Table No. - Distribution of Dwelling Units - December 1951

State	Structure Only	Improvement Alone Only	Both	Total	Refused to Give Any Data	Commercial Use Only	Both
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

BLACK CURRANT ERADICATION

The cooperating states are eliminating Ribes nigrum as rapidly as practicable. During the past few years, such work has been conducted as a special project in Massachusetts, Rhode Island, Connecticut and New York (all of these states, except Massachusetts, have definite state laws which prohibit the possession of Ribes nigrum). In the other Northeastern States, except New Jersey, the black currants are destroyed in conjunction with the regular Ribes eradication work. It will, however, be necessary in these states to make special arrangements for eliminating Ribes nigrum outside the control areas.

Black currant elimination work was conducted as a special project in Massachusetts, Rhode Island, Connecticut, and New York during 1933. Such activities were performed in a total of 127 towns, and the work was completed in 125 towns, 78 of which were in New York. A total of 12,844 black currants and 3,027 other cultivated Ribes were removed in connection with these projects at a total cost of $12,747.15. All of this work was conducted under the regular cooperative program, except in Rhode Island where one Nira crew of 10 laborers was used on the project in the City of Providence for 900 man hours during October. The men scouted 16,044 properties locating and destroying 280 European black currant bushes at a total cost of $473.80.

Table 41.- Summary of Special Black Currant Eradication Work in Northeastern States - 1933

(Includes work performed under E.C.W. Program and Regular Cooperative Program)

State	No. Towns		Ribes Pulled			Man Hours	Cost			
	Worked	Completed	Nigrum	Other Cult.	Total		Indiv.	Govt.	State	Total
Mass.	38	36	2,182	-	2,182	4,579	$224.25	-	$2,309.01	$2,533.26
R.I.	1	1	543	-	543	1,300	-	473.80	326.11	799.91
Conn.	10	10	82	3,027	3,109	3,567	-	1,768.16	755.33	2,523.49
N.Y.	78	78	10,037	-	10,037	10,501	-	-	6,890.49	6,890.49
Totals	127	125	12,844	3,027	15,871	19,947	$224.25	$2,241.96	$10,280.94	$12,747.15

Table 42.- Summary of All Special Black Currant Eradication Work in Northeastern States, 1918-1933

State	Ribes Pulled			Cost			
	Nigrum	Other Cult.	Total	Indiv.	Govt.	State	Total
Mass.	28,791*	-	28,791	$1,854.50	$ 100.00	$18,932.80*	$20,887.30
R.I.	16,219	1,093	17,312	-	1,149.33	9,178.55	10,327.88
Conn.	354	18,696	19,050	-	4,559.68	2,509.33	7,069.01
N.Y.	34,345	761	35,106	-	-	25,376.74	25,376.74
Totals	79,709	20,550	100,259	$1,854.50	$5,809.01	$55,997.42	$63,660.93

*Includes 556 bushes pulled in connection with special Ribes eradication work around nurseries in 1925 and 1926 at a cost of $367.89 to the state.

BLACK CURRANT ERADICATION

The cooperating states are eliminating Ribes plants as rapidly as practicable. During the past few years, much work has been conducted as a special project in Massachusetts, Rhode Island, Connecticut and New York (all of these states, except Massachusetts, have definite state laws which prohibit the possession of Ribes plants). In the other Northeastern States, except New Jersey, the black currants are destroyed in conjunction with the regular Ribes eradication work. It will, however, be necessary in these states to make special arrangements for eliminating Ribes plants outside the control areas.

Black currant eradication work was conducted as a special project in Massachusetts, Rhode Island, Connecticut, and New York during 1933. Such activities were performed in a total of 127 towns, and the work was completed in 125 towns, 78 of which were in New York. A total of 12,896 black currants and 3,627 other cultivated Ribes were removed in connection with these projects at a total cost of $12,717.15. All of this work was conducted under the regular cooperative program, except in Rhode Island where one Mix crew of 10 laborers was used on the project in the City of Providence for 900 man hours during October. The men counted 16,044 properties locating and destroying 230 European black currant bushes at a total cost of $172.8

Table 41.- Summary of Special Black Currant Eradication Work in Northeastern States - 1933

(Includes work performed under E.C.W. Program and Regular Cooperative Program)

State	Towns Completed	Towns Worked	Ribes Pulled Other Cult.	Ribes Pulled Total	Man Hours	Cost Insiv.	Cost Port.	Cost State	Total
Mass.	78	36	2,182	2,182	4,579	$2254.25	-	$ 500.01	$
R.I.	1	1	514	-	1,200	-	473.80	126.13	
Conn.	10	10	32	3,027	3,059	-	1,169.16	753.33	
N.Y.	78	78	10,027	10,027	10,501	-	-	6,830.49	6,
Total	127	125	12,844	15,271	19,347	$2254.25	$1643.96	$8210.96	$12,

Table 42.- Summary of All Special Black Currant Eradication Work in Northeastern States, 1918-1933

State	Ribes Pulled Other Cult.	Ribes Pulled Total	Cost Insiv.	Cost Port.	Cost State	Total
Mass.	28,791*	-	28,791	$ 31,854.50	$ 100.00	$ 4,273.20*	$ 4,373.20
R.I.	16,219	1,293	17,512	-	1,149.33	9,178.55	10,327.88
Conn.	748	18,696	19,052	-	4,529.68	2,529.33	7,059.01
N.Y.	44,446	731	45,196	-	-	25,374.74	25,374.74
Total	79,729	20,720	100,259	$31,854.50	$5,829.01	$35,907.42	$73,590.93

*Includes 595 bushes pulled in connection with special Ribes eradication work around nurseries in 1925 and 1926 at a cost of $357.00 to the state.

C.W.A. Black Currant Survey

A black currant survey was conducted during the fall and winter months of 1933-1934 in Massachusetts and Connecticut in connection with the C.W.A. program. In Massachusetts, 8 C.W.A. men worked a total of 3,584 man hours on the project at a federal cost of $2,688.11. The survey was performed in 15 cities and towns in the Metropolitan Boston area. Nearly 175,000 properties were inspected and 1,272 patches of black currants containing 6,908 bushes were located. These Ribes will be eradicated by state men during 1934. This work will complete the black currant project for the entire state except in eighteen cities and towns, nine of which are partially finished.

In Connecticut, 76 C.W.A. employees, including three foremen and a draftsman, were assigned to a cultivated Ribes survey during the period December 4, 1933 to March 22, 1934. This project included the location of Ribes nigrum and all other cultivated Ribes within 900 feet of white pine areas worth the cost of protection. The work was supervised by the state blister rust control leader, who was assisted by two foremen, one paid from N.R.A. funds, and the other by the state. The survey was completed in 36 towns and partially finished in one additional town. Nearly 29 thousand interviews and follow-up calls were made. The survey revealed 4,928 currant patches containing 53,812 bushes, 2.4% of which were European black currants. Adequate map and card records were kept showing the location of the bushes with respect to white pine, attitude of owners concerning the removal of the bushes, etc. In this connection, nearly 70% of the owners expressed their willingness to sacrifice their bushes, while only about 3% of them were reluctant. The attitude of the remaining owners could not be determined at the time of the survey. The Connecticut survey gave over 16,000 man hours employment involving a total expenditure of $9,616.09, more than 88% of which was for wages. Plans have been made under the E.R.A. program in Connecticut for the destruction of the cultivated Ribes which were located during the C.W.A. survey as within infecting distance of white pine.

Table 43.- Status of Special Black Currant Eradication Projects In Northeastern States - April, 1934

State	Years Work Performed	Total No. Towns in State	No. Towns Where Black Currant Erad. Work		No. Towns Where Black Currants Located but not Erad.
			Completed	Partially Completed	
Mass.	1930-1933, Incl.	355	322	9	15
R.I.	1929-1933, Incl.	39	39	-	-
Conn.	1930-1933, Incl.	168	22	-	37
N.Y.	1928-1933, Incl.	1,012	279	-	-
Totals	-	1,574	662	9	52

C.W.A. Black Currant Survey

A black currant survey was conducted during the fall and winter months of 1933-1934 in Massachusetts and Connecticut in connection with the C.W.A. program. In Massachusetts, 6 C.W.A. men worked a total of 3,248 man hours on the project at a federal cost of $2,065.11. The survey was performed in 15 cities and towns in the Metropolitan Boston area. Nearly 175,000 properties were inspected and 1,975 patches of black currants containing 6,908 bushes were located. There fibes will be eradicated by state men during 1934. This work will complete the black currant project for the entire state except in eighteen cities and towns, nine of which are partially finished.

In Connecticut, 76 C.W.A. employees, including three foremen and a draftsman, were assigned to a cultivated Ribes survey during the period December 4, 1933 to March 22, 1934. This project included the location of Ribes nigrum and all other cultivated Ribes within 200 feet of white pine areas with the cost of protection. The work was supervised by the state blister rust control leader, who was assisted by two foremen, one part time W.P.A. timeman, and the other by the state. The survey was completed in 76 towns and partially finished in one additional town. Nearly 29 thousand interviews and follow-up calls were made. The survey revealed 4,928 currant patches containing 33,812 bushes, 2.4% of which were European black currants. Accurate map and card records were kept showing the location of the bushes with respect to white pine, statistics of owners concerning the removal of the bushes, etc. In this connection, nearly 70% of the owners expressed their willingness to sacrifice their bushes, while only about 3% of them were reluctant. The attitude of the remaining owners could not be determined at the time of the survey. The Connecticut survey gave over 16,000 man hours employment involving a total expenditure of $3,616.03, more than 88% of which was for wages. Plans have been made under the W.P.A. program in Connecticut for the destruction of the cultivated Ribes which were located during the C.W.A. survey as within infecting distance of white pine.

Table 43.- Status of Special Black Currant Eradication Projects
In Northeastern States - April, 1934

State	Years Work Performed	Total No. Towns in State	No. Towns Where Black Currant Eradi. Work		No. Towns Where Black Currants Located but not Eradi.
			Completed	Partially Completed	
Mass.	1930-1933, Incl.	351	322	6	15
R.I.	1929-1933, Incl.	39	39	-	-
Conn.	1930-1933, Incl.	169	92	-	37
N.Y.	1924-1933, Incl.	1,012	872	-	-
Totals	-	1,571	925	6	52

Table 44.-Summary of State Compensation Paid for Cultivated Ribes Destroyed in Northeastern States

State	Period	Total Number Cultivated Ribes Destroyed	No. Bushes for Which Compensation Was Actually Paid	No. Persons Paid Compensation	Amount Paid in Reimbursement
Me.	1933	4,987	0	0	0
	1922-1933	122,520	0	0	0
	1918-1933	124,099	0	0	0
N.H.	1933	757	0	0	0
	1922-1933	83,215	752	26	138.15
	1918-1933	144,732	2,008	63	550.60
Vt.	1933	228	17	1	4.25
	1922-1933	10,870	1,539	122	742.91
	1918-1933	11,152	1,594	128	766.91
Mass.	1933	5,213	194	3	55.85
	1922-1933	264,867	23,125	384	8,273.05
	1918-1933	275,212	40,297	640	14,229.35
R.I.	1933	736	0	0	0
	1922-1933	26,130	94	7	35.85
	1918-1933	30,381	1,410	58	509.79
Conn.	1933	3,221	0	0	0
	1922-1933	42,372	175	16	103.50
	1918-1933	42,380	175	16	103.50
N.Y.	1933	13,561	270-Est.	Est.-20	108.00
	1922-1933	81,497	4,767	736	1,953.41
	1918-1933	95,240	15,014	1,043	5,026.99
N.E. & N.Y.	1933	28,703	481	24	168.10
	1922-1933	631,471	30,452	1,291	11,246.87
	1918-1933	723,196	60,498	1,948	21,187.14
N.J.	1933	0	0	0	0
	1922-1933	49	0	0	0
	1918-1933	49	0	0	0
Pa.	1933	263	0	0	0
	1922-1933	5,791	0	0	0
	1918-1933	5,791	0	0	0
All States	1933	28,966	481	24	168.10
	1922-1933	637,311	30,452	1,291	11,246.87
	1918-1933	729,036	60,498	1,948	21,187.14

The Vermont data include $86.25 compensation paid by individual cooperators in 1926 and 1933 to 10 owners of cultivated Ribes for the removal of 181 bushes.

The Massachusetts data include $5,655.05 paid in 1918 to 253 persons for 16,517 bushes destroyed in 1917 and 1918, mostly in 1917. It is impossible to separate the 1917 data.

The Connecticut data include $76.25 paid in 1930 by individual cooperators (nurserymen) to 12 owners of cultivated Ribes for the removal of 114 bushes.

Table 4.--Summary of State Governments Paid for Cultivated Vines Captured in Intermediary Stores

State	Period	Total Number Cultivated Vines Destroyed	30. Persons Paid Cooperation	31. Persons for Which Compensation Has Already Been Paid	Amount Paid to Persons
	1913	4,917	0		
Va.	1912-1914	122,520	0		
	1916-1917	108,049	0		
	1913	157	0		
N.Y.	1912-1913	83,213	75		
	1914-1915	14,752	2,103		
	1913	429	1		
Vt.	1912-1913	10,610	129		
	1914-1915	11,150	128		
	1913	2,214	34		
Mass.	1912-1913	224,001	324		
	1914-1915	218,812	540		
	1913	176	0		
R.I.	1912-1913	63,130	7		
	1914-1915	30,381	55		
	1913	2,221	0		
Conn.	1912-1913	42,372	16		
	1914-1915	42,250	16		
	1913	13,961	84		
N.Y.	1912-1913	81,417	1,618		
	1914-1915	38,243	1,012		
	1913	84	0		
N.J.	1912-1913	531,471	1,291		
P.I.	1914-1915	125,126	1,345		
	1913	0	0		
N.C.	1912-1913	42	0		
	1914-1915	42	0		
	1913	253	0		
Pa.	1912-1913	3,131	0		
	1914-1915	3,131	0		
	1913	261	0		
All States	1912-1915	1,328,427	1,946		

The Vermont data include $26.25 compensation paid by individual cooperators in 1910 and 1913 to 10 owners of cultivated Vines for the removal of 131 bushes.

The Massachusetts data include $5,653.05 paid in 1915 to 643 persons for 15,317 bushes destroyed in 1913 and 1914, mostly in 1913. It is impossible to segregate the 1913 data.

The Connecticut data include $75.25 paid in 1910 by individual cooperators (nurserymen) to 12 owners of cultivated Vines for the removal of 114 bushes.

TREATMENT OF DISEASED PINES BY CANKER REMOVAL - 1933

At Acadia National Park, the enlisted personnel from a local C.C.C. camp spent a total of 2,457 man hours during the period from September 12 to December 8, 1933 on the treatment of diseased pines. The work consisted of pruning branch cankers, cutting out stem cankers which had not extended more than 2/3 around the trunks, removing infected tops and cutting down entire trees when fatally diseased. The project was limited to ornamental pines located in the public camp grounds, and along roads and trails in the vicinity of Bar Harbor. The infected trees, averaging 46 feet in height, extended over an area of approximately 60 acres. A total of 849 fatally diseased pines were cut down. In addition, 283 stem cankers were cut out, and 5,762 infected branches and 273 tops were removed.

Agent Bradbury also supervised canker removal work in a five acre white pine plantation on the Gorham H. Woods estate in Bangor, Maine. Thirty-four percent of the pines planted in 1900 and averaging about 30 feet in height, were heavily infected with branch and stem cankers. A total of 875 trees were treated, 677 branch infections were removed, 46 dead or doomed trees cut down, and 66 trunk cankers treated by removing the infected bark. The cost to the owner was $78.00.

Under the C.W.A. program in Massachusetts, the treatment of diseased white pines was conducted in three of the agent districts, 4,341 acres of pine being examined on municipally-owned lands. A total of 17,303 pines with stem cankers were destroyed, and 17,511 branch infections were pruned from 12,784 other pines. This project consumed man hours during the period from and cost . The work was carried on under many handicaps, including the most severe winter experienced in years.

In New York, the ornamental pines on the state reservation at Saratoga were examined for infections by state employees. The area contains 75 acres of plantations about 20 years old. There is also considerable natural white pine scattered over some 700 acres of woodlands. The pines had previously been pruned to a height of 6 feet which aided materially in inspecting them for infection. The inspections disclosed a total of 113 diseased trees, 49 of which had died from blister rust. These dead trees were cut and limb infections were also removed from 64 other pines.

Elimination of blister rust cankers was also conducted in a 40-acre state plantation in the town of Hensonville in Greene County, New York. This work was done under the N.R.A. program by a 12-man crew during the period from September to November, 1933. The pines were pruned of lower branches to an average height of four feet, thereby eliminating a majority of the infections. All other visible branch cankers were removed, and the trees with stem infections were cut down.

Additional canker removal work was performed at Spruceton in Greene County and on the Wilcox plantation in Warren County. No figures are available at this time concerning the results accomplished on these two areas.

TREATMENT OF TIMBERED AREAS BY CLEAN REMOVAL - 1933

At Acadia National Park, the enlisted personnel from a local C.C.C. camp spent a total of 4,457 man hours during the period from September 15 to December 8, 1933 on the treatment of timbered plots. The work consisted of pruning branch cankers, cutting out stem cankers which had not extended more than 2½ around the trunks, removing infected tops and cutting down entire trees when fatally diseased. The project was limited to ornamental pines located in the public camp grounds, and along roads and trails in the vicinity of Bar Harbor. The infected trees, averaging 40 feet in height, extended over an area of approximately 80 acres. A total of 849 fatally diseased pines were cut down. In addition, 283 stem cankers were cut out, and 5,432 infected branches and 213 tops were removed.

Agent Bradbury also supervised similar removal work in a fire zone white pine plantation on the Gorham R. Woods estate in Bangor, Maine. Thirty-four percent of the pines planted in 1900 and averaging about 70 feet in height, were heavily infected with branch and stem cankers. A total of 875 trees were treated, 577 branch infections were removed, 45 dead or doomed trees cut down, and 66 trunk cankers treated by removing the infected bark. The cost to the owner was $78.00.

Under the C.W.A. program in Massachusetts, the treatment of diseased white pines was conducted in three of the agent districts, 4,341 acres of pine being examined on municipally-owned lands. A total of 17,203 pines with stem cankers were destroyed, and 17,311 branch infections were pruned from 12,784 other pines. This project consumed man hours during the period from and cost . The work was carried on under very unfavorable conditions, including the most severe winter experienced in years.

In New York, the ornamental pines on the state reservation at Saratoga were examined for infections by state employees. The area contains 75 acres of plantations about 20 years old. There is also considerable natural white pine scattered over some 700 acres of woodlands. The pines had previously been pruned to a height of 6 feet which aided materially in inspecting them for infection. The inspections disclosed a total of 113 diseased trees, 49 of which had died from blister rust. These dead trees were cut and limb infections were also removed from 34 other pines.

Elimination of blister rust cankers was also conducted in a 40-acre state plantation in the town of Hancockville in Bryane County, New York. This work was done under the E.R.A. program by a 12-man crew during the period from September to November, 1933. The pines were pruned of lower branches to an average height of four feet, thereby eliminating a majority of the infections. All other visible branch cankers were removed, and the trees with stem infections were cut down.

Additional canker removal work was performed at Spurgeton in Bryane County and on the Tilson plantation in Warren County. No figures are available at this time concerning the results accomplished on these two areas.

PINE AND CONTROL AREA MAPPING

During the period from October, 1933 to April, 1934, inclusive, pine and control area mapping was performed in all the Northeastern States, except New Jersey. Most of the work was conducted by 93 temporary Nira employees and 30 E.C.W. checkers. However, ten of the permanent district agents in three states spent 506 man days on mapping work. In addition, 27 C.W.A. workers in Massachusetts were employed 586 man days on this project. The mapping is an essential part of control work and an important factor in reducing eradication costs. The permanent agents mapped 121,076 acres consisting of pine and protection zones, and inspected and eliminated from control work 191,051 additional acres. One hundred and fifty temporary employees worked a total of 8,211 eight-hour man days. Their efforts resulted in mapping 887,869 acres and the examination of 683,036 additional acres, which were eliminated from control work. The accomplishments under each program are summarized by states in Tables 45 to 48.

Table 45.- Pine and Control Area Mapping in Northeastern States Under N.R.A. Program - October, 1933 to April, 1934

State	No. Men Employed		No. Man Days		Distribution of Work		Acreage	
	Temp. Agents	Laborers	Temp. Agents	Laborers	No. Counties	No. Towns	Mapped	Inspected but not Mapped
Me.	4*	0	513	0	7	20	128,921	214,596
N.H.	15	0	1,571	0	7	40	105,489	0
Vt.	4	0	403	0	5	17	69,750	153,800
Mass.	2	0	84	0	2	4	5,567	2,500
R.I.	4	0	417	0	2	3	46,009	0
Conn.	2	0	144	0	4	9	41,330	130,925
N.Y.	19	38	1,010	646	14	113	102,428	?
N.E.& N.Y.	50	38	4,142	646	41	206	499,494	501,821+
Pa.	2	3	133	122	3	30	12,912	?
Totals	52	41	4,275	768	44	236	512,406	501,821+

*Paid from state funds during April, 1934.

FIRE AND CONTROL AREA ACCEPTED

During the period from October, 1935 to April, 1936, inclusive, fire and control area repairs were performed in all the Northwestern States, except Oregon. Work of this nature was conducted by 37 temporary Fire employees and 70 U.S.E. shopmen. However, ten of the permanent district agents in Fire states spent 50% or more time on repair work. In addition, 17 U.S.E. workers in Headquarters also employed 50% or more time on this project. The remaining is an essential part of control work and an important factor in reducing standardization costs. The performance record (21,715 acres consisting of fire and protection zones, and inspected and eliminated from control work 191,091 additional acres. One hundred and fifty temporary employees worked a total of 1,211 eight-hour man days. Their efforts resulted in removing 387,809 acres and the examination of 653,095 additional acres, which were eliminated from control work. The accomplishments under each project are summarized by states in Tables 45 to 49.

Table 45.- Fire and Control Area Repairs in Northwestern States
Under U.S.A. Program - October, 1935 to April, 1936

State	No. Men Employed		No. Man Days	Distribution of Work		Acreage	
	Temp.	Perm.		Cmpts.	No. Camps Operating	Improved but not Repaired	Repaired
Wn.	42	0	1,275	0	7	128,321	214,596
N.H.	15	0	1,171	0	7	40	105,449	0
Wn.	4	0	407	0	5	17	69,720	152,800
Oregon.	8	0	414	0	6	4	3,867	5,000
S.I.	4	0	417	0	2	3	46,009	0
Oppn.	2	0	144	0	1	0	43,370	120,021
W.T.	19	14	3,010	646	14	117	106,128	2
C.I.S. W.T.	50	48	4,142	646	41	203	404,424	321 +
Cn.	6	2	477	126	2	20	16,912	2
Total	92	41	4,275	786	44	636	916,400	301,341 +

*Held fire crews during April, 1936.

Table 46.- Pine and Control Area Mapping in Northeastern States Performed by Permanent District Agents During October, 1933 to April, 1934

State	No. Permanent Agents	No. Man Days Mapping	No. Towns Mapped	Acreage	
				Mapped	Inspected but Not Mapped
Me.	4	326	20	99,384	186,351
N.H.	4	27	4	1,832	0
Vt.	2	153	13	19,860	4,700
Totals	10	506	37	121,076	191,051

Some mapping work was performed by the permanent agents in New York, but no data are available at this time.

Table 47.- Pine and Control Area Mapping in Northeastern States Under E.C.W. Program - October, 1933 to April, 1934

State	Checkers		Distribution of Work		Acreage	
	Number	Man Days	No.Counties	No. Towns	Mapped	Inspected but Not Mapped
Me.	7	1,046	6	18	158,929	78,344
N.H.	5	522	7	13	30,732	0
Vt.	3	382	3	15	62,094	18,000
R.I.	2	121	2	2	21,134	0
Conn.	3	247	3	7	37,922	76,735
Pa.	10	264	16	41	25,335	0
Totals	30	2,582	37	96	336,146	173,079

Table 48.- Pine and Control Area Mapping in Massachusetts Under C.W.A. Program - December, 1933 to April, 1934

State	No.Men Employed		Number Man Days		Distribution of Work		Acreage	
	Mappers	Laborers	Mappers	Laborers	No.Counties	No.Towns	Mapped	Not Mapped
Mass.	14	13	332	254	4	11	39,317	8,136

In addition, an N.R.A. agent spent 104 man days supervising the C.W.A. mapping work.

Table 46.- Fire and Control Area Mapping in Northeastern States Performed by Permanent District Agents During October, 1923 to April, 1924

State	No. Permanent Agents	No. Town Days Mapping	Mapped	Increase Not Mapped
Me.	4	256	69,584	185,371
N.H.	4	27	1,432	0
Vt.	2	152	19,800	4,200
Total	10	506	121,076	191,051

Some mapping work was performed by the permanent agents in New York, but no data are available at this time.

Table 47.- Fire and Control Area Mapping in Northeastern States Under E.C.W. Program - October, 1923 to April, 1924

State	Number	Man Days	No. Counties	No. Towns	Mapped	Not Mapped
Me.	7	1,046	6	18	156,929	78,414
N.H.	5	522	7	13	70,132	0
Vt.	3	382	3	15	56,094	18,030
R.I.	2	121	2	2	21,124	0
Conn.	1	247	1	7	37,929	76,125
Pa.	10	264	16	41	25,332	0
Total	30	2,582	17	96	375,146	173,019

In addition, an N.Y.A. agent spent 10½ man days supervising the C.W.A. mapping work.

Table 48.- Fire and Control Area Mapping in Connecticut by U.S.A. Program - December, 1933 to April, 1934

State	No. Men Employed	Number Man Days	Distribution of Work		Acreage	
			No. Counties	No. Towns	Mapped	Not Mapped
Conn.	14	17	258	4	11	10,317	8,176

In addition, an N.Y.A. agent spent 10½ man days supervising the C.W.A. mapping work.

Table 49.-Personnel Employed on Blister Rust Control Work in The Northeastern States During 1933

State		Me.	N.H.	Vt.	Mass.	R.I.	Conn.	N.Y.	N.J.	Pa.	Totals
State Leaders		1	1	-	1	1	1	1	1	1	8
Permanent District B.R.C. Agents		4	6	3	5	-	-	10	-	3*	31
Supervisors, Checkers, and Tech. Foremen	Regular	-	2	-	-	1	1	6	-	2	12
	E.C.W.	47	42	15	8	4	12	67	-	45	240
	N.R.A.	4	-	2	-	-	2	-	-	-	8
	Total	51	44	17	8	5	15	73	-	47	260
Crew Foremen & Scouts	Regular	18	39	5	24	1	-	70	-	10	167
	N.R.A.	19	-	18	8	-	6	4	-	11	66
	Total	37	39	23	32	1	6	74	-	21	233
Laborers	State	138	204	-	-	4	8	200	1	50	605
	Owners	4	-	154	954	-	-	600	-	14	1,726
	E.C.W.**	389	397	187	99	22	144	441	-	344	2,023
	N.R.A.	96	-	197	79	10	83	24	-	127	616
	Total	627	601	538	1,132	36	235	1,265	1	535	4,970
Total		720	691	581	1,178	43	257	1,423	2	607	5,502

*Includes state agent May.
**Average number

A total of at least 3,776 state and federal employees were engaged in cooperative blister rust control work in the Northeastern States during 1933. Actually, the number employed is greater than the amount indicated since E.C.W. figures for enlisted personnel were based on the average number of men used on the control project. An additional 1,726 individuals (pine or Ribes "owners" or their employees) assisted in eradicating Ribes. Thus, 5,502 persons actually participated in the field work. Many owners also paid for the work on their lands, but took no personal part in pulling the bushes. Several hundred other persons permitted the destruction of their cultivated Ribes without compensation. Estimated conservatively, 6,700 individuals had more or less of an active part in the control work. The district blister rust control agents also reported that 2,682 persons gave general support to the work, making a total of 9,382 individuals who cooperated directly or indirectly in the control programs.

Table 19.--Personnel Employed on Pilot Boat Control Work in The Northeastern States During 1933

State	No.	S.E.	W.	Mass.	N.I.	Conn.	N.Y.	N.J.	Total
State Leaders	1	1	-	1	1	1	1	1	7
Permanent District C.E.C. Agents	4	6	3	5	-	-	10	-	28
Supervisors, Inspectors, and Tech. Foremen: Regular	-	2	-	-	1	1	5	-	9
C.W.A.	12	12	15	3	4	12	61	-	119
T.A.A.	4	-	2	-	-	2	-	-	8
Total	21	14	17	8	5	15	71	-	151
Crew Foreman: Regular	16	34	3	24	1	-	20	-	98
C.W.A.	15	-	12	8	-	5	4	1	45
& Counts: Total	31	34	23	32	1	5	24	-	143
State	139	204	-	-	4	8	200	1	556
Crews: C.W.A.	4	-	181	94	-	-	60	-	139
C.C.C.**	83	342	187	99	22	104	41	-	878
N.R.A.	5	-	127	79	10	84	14	-	319
Total	231	601	538	1,112	37	374	1,265	1	4,159
Total	720	691	591	1,178	47	397	1,423	2	5,449

*Includes state agent key.

**Average number

A total of at least 3,715 state and federal employees were engaged in cooperative pilot boat control work in the Northeastern States during 1933. Actually, the number employed is greater than the amount indicated since E.C.W. figures for enlisted personnel were based on the average number of men used on the control project. An additional 1,756 individuals (pilots or fishermen "owners" or their employees) assisted in erecting fishes. Some, 5,562 persons actually participated in the field work. Many owners also paid for the work on their lands, but took no personal part in pulling the brushes. Several hundred other persons partially the destruction of their cultivated fishes without compensation. Estimated conservatively, 6,750 individuals had more or less of an active part in the control work. The district pilot trust control agents also reported that 2,682 persons gave general support to the work, making a total of 9,432 individuals who cooperated directly or indirectly in the control programs.

PERSONNEL OF DIVISION OF BLISTER RUST CONTROL IN THE NORTHEASTERN STATES

EASTERN CONTROL PROGRAM (COOPERATIVE ACTIVITIES)
J. F. MARTIN – SR. PATH. (WASHINGTON, D.C.)

NORTHEASTERN STATES (BOSTON, MASS.)
E. C. FILLER – SR. PATH.
K. K. STIMSON – Agent
C. A. PURCELL – Jr. Clk. Sten.

CONTROL SPECIALISTS
L. W. HODGKINS – Agent
K. K. STIMSON "

ACADIA NATIONAL PARK
ALLEGHENY NAT. FOREST
Temporary Personnel assigned as needed.

MAINE
W. O. FROST Assoc. Path. (State Leader)

CONTROL UNITS

- **BELFAST** — H. G. BRADBURY – Agent
- **AUBURN** — G. H. KIMBALL – Agent
- **NORTH BRIDGTON** — P. S. CURTIS – Agent
- **WATERVILLE** — J. M. WHITE – Agent

NEW YORK
H. L. Mc INTYRE – Collab. (State Leader)

CONTROL UNITS

- **WARRENSBURG** — N. H. MARPP – Agent; E. G. WOODWARD "
- **SARATOGA SPRINGS** — P. E. BARBER – Agent
- **HYDE PARK** — H. G. STRAIT – Agent
- **GLOVERSVILLE** — J. W. CHARLTON – Agent
- **LEWIS** — B. H. NICHOLS – Agent
- **BATH** — H. W. HOLCOMB – Agent
- **SAND LAKE** — H. J. Mc CASLAND – Agent
- **GOUVERNEUR** — C. B. KRESGE – Agent
- **BOONVILLE** — T. P. WOOLSCHLAGER – Agent

NEW HAMPSHIRE
L. E. NEWMAN – Agent (State Leader)
I. W. PEABODY – Clerk (Coop.)

CONTROL UNITS

- **KEENE** — F. J. BAKER – Agent
- **CONCORD** — T. J. KING – Agent
- **LEBANON** — G. F. RICHARDSON – Agent
- **CONWAY** — S. H. BOOMER – Agent
- **EXETER** — L. C. SWAIN – Agent
- **WOODSVILLE** — T. L. KANE – Agent

MASSACHUSETTS
C. C. PERRY – Agent (State Leader)
M. E. CALLEN – Clerk (Coop.)

CONTROL UNITS

- **W. SPRINGFIELD** — R. E. WHEELER – Agent
- **NORTH ABINGTON** — E. M. BROCKWAY – Agent
- **GT. BARRINGTON** — G. S. DOORE – Agent
- **ARLINGTON HGTS.** — W. T. ROOP – Agent
- **WORCESTER** — WM. CLAVE – Agent

NEW JERSEY
P. B. MOTT – Agent (State Leader)

CONNECTICUT
J. E. RILEY Assoc. Path. (State Leader)

CONTROL UNIT

Temporary Personnel assigned as needed.

VERMONT
P. H. MERRILL – Collab. (State Leader)

CONTROL UNITS

- **RUTLAND** — W. E. BRADDER* – Agent
- **ST. JOHNSBURY** — E. H. PALMER* – Agent
- **BELLOWS FALLS** — F. H. ROSE – Agent

RHODE ISLAND
A. W. HURFORD – Agent (State Leader)

CONTROL UNIT

Temporary Personnel assigned as needed.

PENNSYLVANIA
R. P. FATZINGER – Agent (State Leader)

CONTROL UNITS

- **TEMPORARY** — Personnel assigned as necessary
- **BROOKVILLE** — M. DE BERTI – Agent

* PART TIME.

Table 50. - Per Cent of Time Spent on Each Activity by Average Permanent Agent in New England and New York - 1933

State	Education		Personal Service		Supervision		Field Data		Scouting	Office (Routine)	Travel
	Office	Field	Office	Field	Office	Field	Office	Field			
Me.	.2	.8	-	8.9	4.4	29.3	1.8	10.0	2.2	16.9	25.5
N.H.	3.1	3.4	1.1	10.0	4.4	32.6	4.3	4.4	2.5	12.5	21.7
Vt.	.6	1.4	.1	13.6	.4	22.4	4.6	11.1	9.5	15.2	21.1
Mass.	1.3	2.8	.7	6.7	2.8	24.3	3.9	4.0	5.4	26.1	22.0
R.I.	6.5	6.1	11.8	4.4	29.4	19.6	.1	-	1.8	4.0	15.3
Conn.	No permanent agents employed										
N.Y.	1.4	1.3	.4	7.1	4.0	17.3	16.9	10.9	6.2	13.1	21.4
Totals	1.7	2.2	.9	8.5	4.5	24.2	8.0	7.8	4.8	15.5	21.9

The average permanent agent worked 334.9 eight-hour working days during the year.

Portion of Time Spent on Each Activity by Average Permanent Agent in New England and New York During 1933

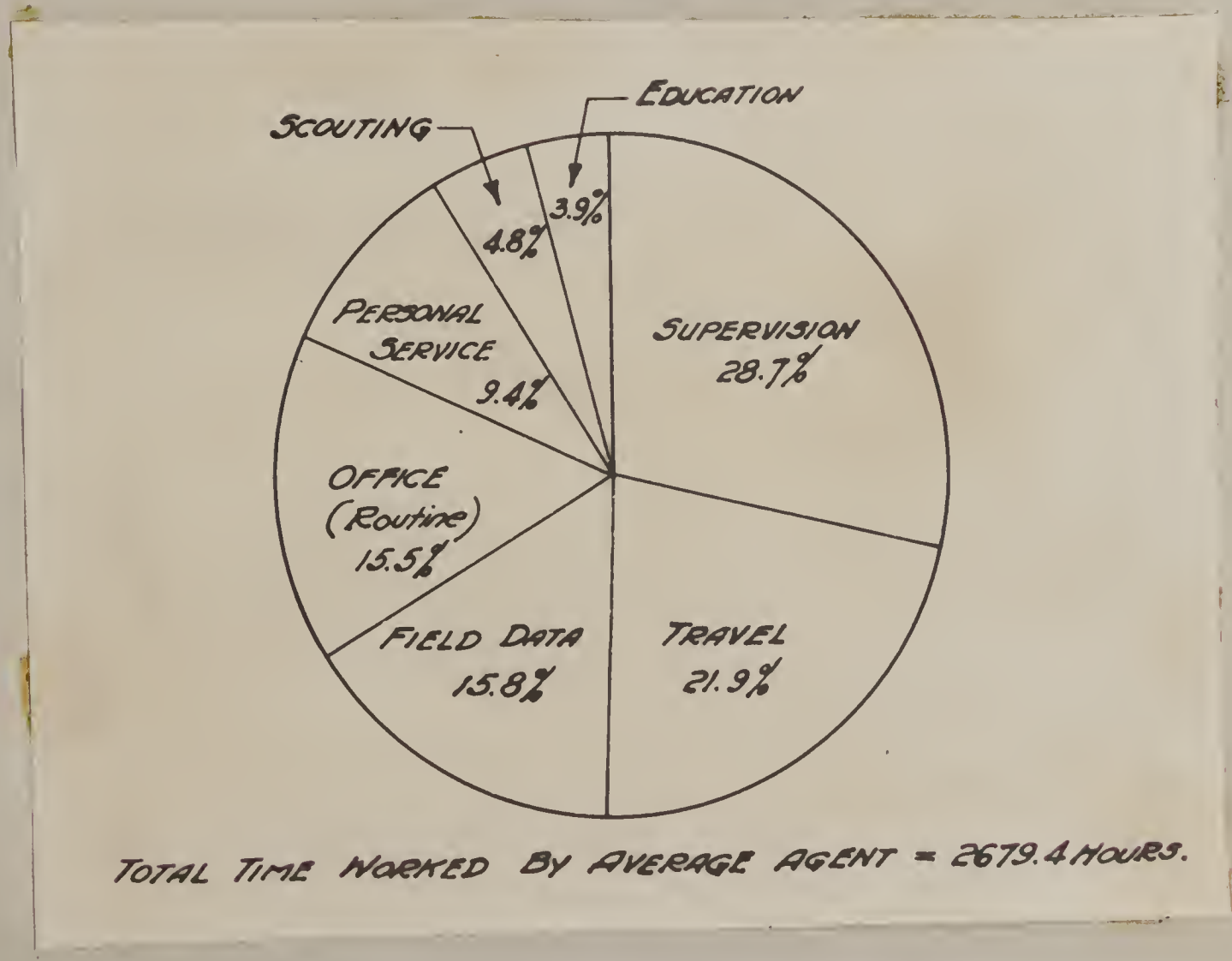


Table 59. - [illegible] Spent on Tech [illegible]ity by Average Permanent Agent in New [illegible] and New York - 1927

State	Advertising		Personal Service		Supervision		Field Data		Soothing	Office (Routine)	Travel
	Office	Field	Office	Field	Office	Field	Office	Field			
[illegible]	.E	.3	-	8.9	M.M	22.2	1.8	13.7	6.3	15.0	[illegible]
[illegible]	7.1	7.4	1.1	11.0	M.M	12.0	M.J	M.M	2.5	22.E	[illegible]
[illegible]	.0	1.H	.1	12.2	.0	0.0	M.J	11.1	2.E	16.8	[illegible]
[illegible]	1.3	2.8	.7	E.2	1.8	M.1	1.	1.0	2.4	22.1	[illegible]
[illegible]	0.C	0.1	11.4	29.0	12.	.1	-	-	1.2	4.0	1E.
[illegible]			No permanent agents reported								
[illegible]	1.4	1.2	.1	4.0	1.2	12.2	1.0	1.2	2.6	17.1	21.
[illegible]	1.1	2.2	.2	4.2	M.C	M.2	1.2	1.2	M.2	16.E	2E.

The average permanent agent worked 2M.3 eight-hour working days during the year.

Portion of Time Spent on Tech Activity by Average Permanent Agent in New England and New York During 1927

TOTAL STATE AND FEDERAL EXPENDITURES ON ALL COOPERATIVE BLISTER RUST CONTROL WORK IN NORTHEASTERN STATES

STATE AND FEDERAL COOPERATIVE BLISTER RUST CONTROL FUNDS USED FOR ALL PROJECTS IN NORTHEASTERN STATES DURING CALENDAR YEAR 1933

Table 51.-Source of Total State Funds Expended in Various Northeastern States During Calendar Year 1933

Source of Funds	State Blister Rust Appropriations	Nursery Funds	Town Funds	Individual Funds or Labor	County Funds	All Other Coop. State Funds	Total State Funds
Me.	$ 3,530.50	$ 500.00	$ 4,888.82	$ 76.83	-	$ 31.20	$ 9,027.35
N.H.	7,542.37	-	6,405.22	363.98	-	10,867.25	25,178.82
Vt.	1,538.07	-	120.00	1,682.59	-	-	3,340.66
Mass.	8,969.20	1,429.29	-	3,213.29	-	236.30	13,848.08
R.I.	3,246.47	-	-	-	-	-	3,246.47
Conn.	5,542.13	-	-	-	-	-	5,542.13
N.Y.	45,964.25	-	-	3,511.24	694.49	2,604.39	52,774.37
N.J.	1,620.84	-	-	-	-	5.00	1,625.84
Pa.	7,466.48	-	-	96.14	-	-	7,562.62
All States	$85,420.31	$1,929.29	$11,414.04	$8,944.07	$694.49	$13,744.14	$122,146.34

Table 52.- Percentage of Total State Funds in Respective States Derived From Various Sources

Source of Funds	State Blister Rust Appropriations	Nursery Funds	Town Funds	Individual Funds or Labor	County Funds	All Other Coop. State Funds	Total State Funds
Me.	39.1	5.5	54.2	0.8	-	0.4	100.0
N.H.	30.0	-	25.4	1.4	-	43.2	100.0
Vt.	46.0	-	3.6	50.4	-	-	100.0
Mass.	64.8	10.3	-	23.2	-	1.7	100.0
R.I.	100.0	-	-	-	-	-	100.0
Conn.	100.0	-	-	-	-	-	100.0
N.Y.	87.1	-	-	6.7	1.3	4.9	100.0
N.J.	99.7	-	-	-	-	0.3	100.0
Pa.	98.7	-	-	1.3	-	-	100.0
All States	69.9	1.6	9.3	7.3	0.6	11.3	100.0

Table 24.--Source of Total State Funds Expended in Various Northwestern States During Calendar Year 1933

Source of Funds	State Highway Dept. Appropriations	Treasury Funds	Town Funds	Individual Funds or Labor	County Funds	All Other Coop. State Funds
[illegible]	$ 3,570.50	$ 500.00	$ 6,[illegible].73	70.83	-	$ 71.20
[illegible]	7,[illegible].71	-	6,[illegible].[illegible]	703.98	-	10,561.25
[illegible]	1,[illegible].07	-	125.00	1,022.39	-	-
[illegible]	8,[illegible].20	1,[illegible].23	-	3,[illegible].23	-	275.70
[illegible]	3,[illegible].47	-	-	-	-	-
[illegible]	3,[illegible].13	-	-	-	-	-
[illegible]	[illegible],[illegible].25	-	-	3,[illegible].24	[illegible].40	2,[illegible].70
[illegible]	1,[illegible].84	-	-	-	-	[illegible].00
[illegible]	2,[illegible].48	-	-	96.14	-	-
1 States	[illegible].23	[illegible].[illegible]	[illegible].07	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]

Table 25.- Percentage of Total State Funds in Respective States Derived From Various Sources

Source of Funds	State Highway Dept. Appropriations	Treasury Funds	Town Funds	Individual Funds or Labor	County Funds	All Other Coop. State Funds
[illegible]	79.1	5.5	4.2	0.6	-	0.4
[illegible]	70.3	-	26.4	1.4	-	1.9
[illegible]	46.0	-	3.0	50.4	-	-
[illegible]	0.8	10.1	-	87.3	-	1.7
[illegible]	100.0	-	-	-	-	-
[illegible]	100.0	-	-	-	-	-
[illegible]	51.1	-	-	3.7	1.3	44.2
[illegible]	29.1	-	-	-	-	[illegible].3
[illegible]	[illegible].1	-	-	1.4	-	-
Statewide	64.9	1.5	2.3	7.7	0.5	11.3

Table 53.-Total State and Federal Expenditures in Northeastern States During Calendar Year 1933

State	Total State Expenditures	Total Federal Expenditures				Total State and Federal Expenditures	% Total State and Federal Expenditures Derived From Federal Funds
		B.P.I.	N.R.A.	E.C.W.	Total		
Me.	9,027.35	9,750.17	11,386.90	52,630.56	73,767.63	82,794.98	89.1
N.H.	25,178.82	11,818.35	11,942.56	50,069.93	73,830.84	99,009.66	74.6
Vt.	3,340.66	3,443.47	12,585.79	12,960.70	28,989.96	32,330.62	89.7
Mass.	13,848.08	9,880.94	10,084.69	7,901.82	27,867.45	41,715.53	66.8
R.I.	3,246.47	1,306.16	2,508.74	5,887.35	9,702.25	12,948.72	74.9
Conn.	5,542.13	5,728.84	6,626.71	18,015.57	30,371.12	35,913.25	84.6
N.Y.	52,774.37	15,424.09	20,284.83	53,588.98	89,297.90	142,072.27	62.9
N.J.	1,625.84	674.48	365.50	0	1,039.98	2,665.82	39.0
Pa.	7,562.62	3,603.93	7,105.08	65,102.99	75,812.00	83,374.62	90.9
All States	122,146.34	61,630.43	82,890.80	266,157.90	410,679.13	532,825.47	77.1

In addition, the U. S. Forest Service expended $300.97 and the Bureau of Plant Industry $50.96 for control work at Allegheny National Forest during 1933.

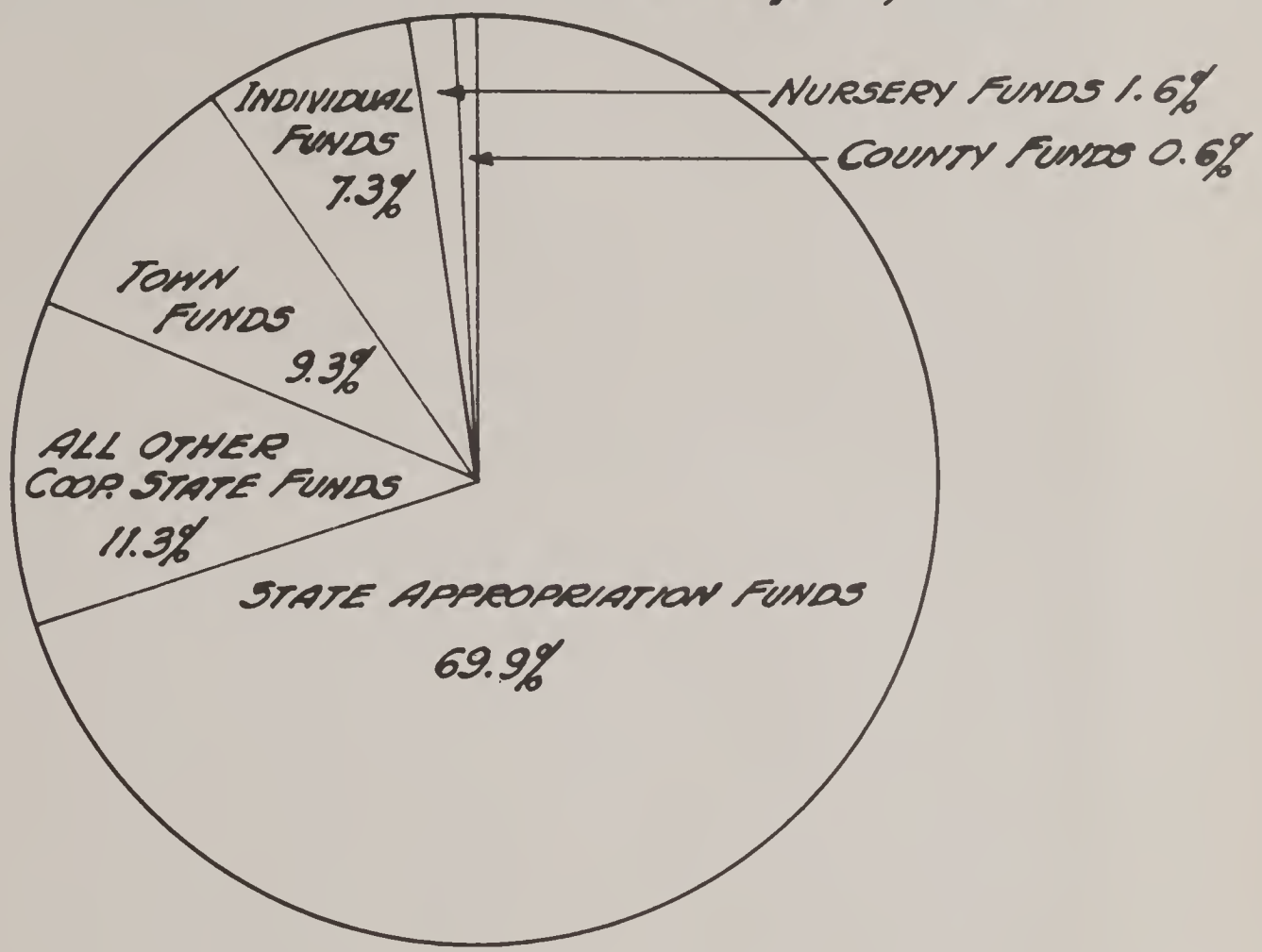
Table 23.--Total State and Federal Expenditures in Northeastern States During Calendar Year 1953

State	Total State Expenditures	Total Federal Expenditures				Total State and Federal Expenditures
		N.P.I.	N.R.A.	E.C.W.	Total	
Maine	9,052,745	9,796,147	12,342,900	68,970,529	[illegible]	[illegible]
New Hampshire	[illegible]	11,821,[illegible]	11,[illegible]	[illegible]	[illegible]	[illegible]
Vermont	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Massachusetts	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Rhode Island	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New York	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Jersey	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pennsylvania	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Maryland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
West Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

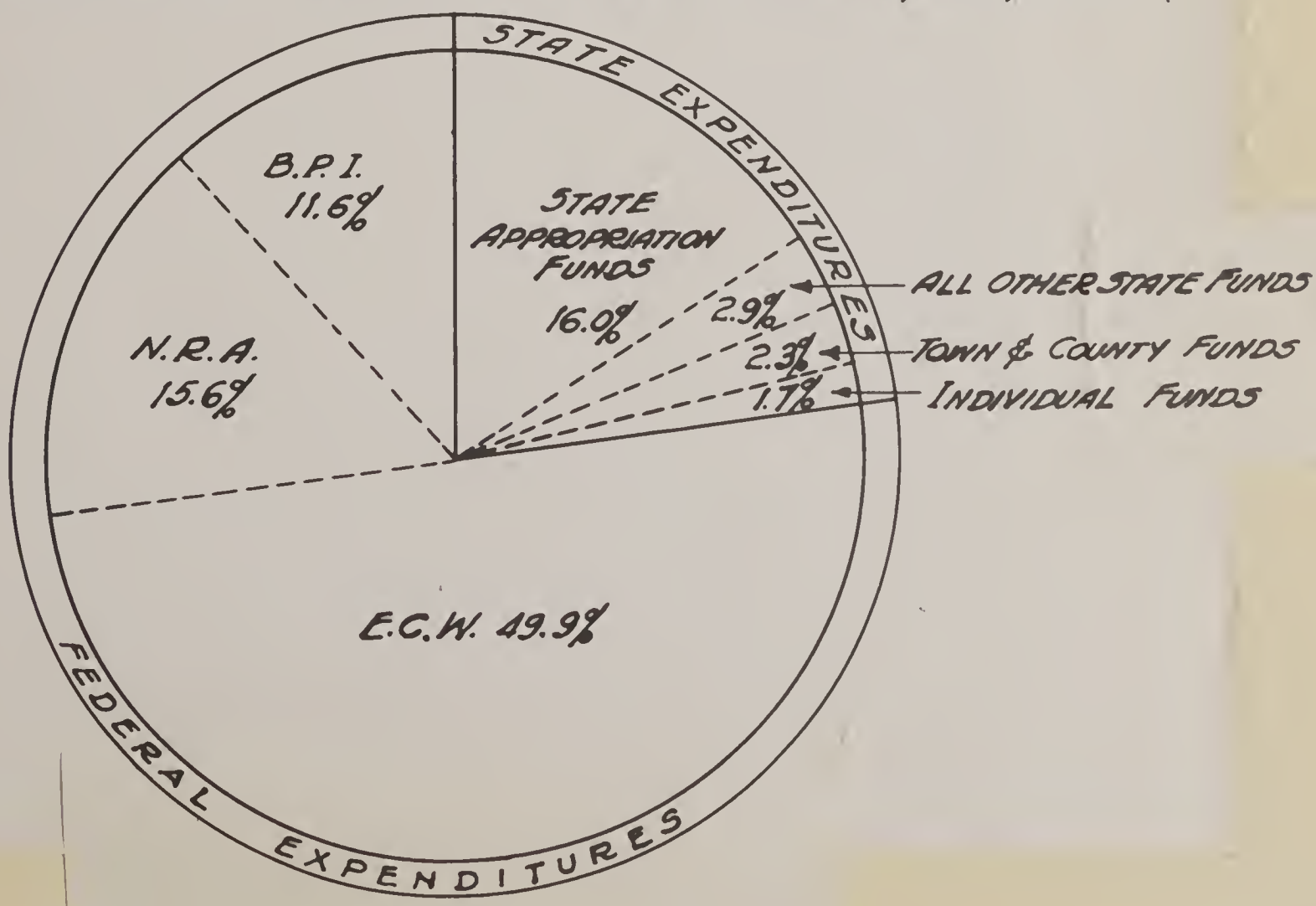
In addition, the U. S. Forest Service expended $300.27 and the Bureau of Plant Industry $26.95 for control work at Allegheny National Forest during 1953.

PERCENTAGE TOTAL BLISTER RUST CONTROL EXPENDITURES NORTHEASTERN STATES CALENDAR YEAR 1933. PAID BY VARIOUS COOPERATING AGENCIES

TOTAL STATE EXPENDITURES = $122,146.34



TOTAL STATE AND FEDERAL EXPENDITURES = $532,825.47



EXPLANATION OF STATE AND FEDERAL EXPENDITURES FOR VARIOUS BLISTER RUST CONTROL PROJECTS IN NORTHEASTERN STATES DURING THE CALENDAR YEAR 1933

(Basis for project costs)

General Supervision

State Expenditures

Maine and Massachusetts: Expenses for state leaders.
New Hampshire: Upkeep and maintenance of state car (except gas and oil) for state leader - state salary of permanent clerk.
Vermont: Salary ($50.00 per month) and expenses of Assistant State Forester Lockard for time spent on blister rust control work.
Connecticut: Expenses of State Cooperator Filley while on blister rust control work - arbitrary part of salary for a permanent stenographer at New Haven office ($55.00 per month) - salary of temporary assistant at New Haven office from September to December.
Rhode Island: One-fourth of expenses paid by state to leader - arbitrary charge of $25.00 per month for clerical assistance at Providence office - one-fourth of cost of automobile purchased for general use - one-half of Agent White's salary during December.
New York: State Leader McIntyre's salary and expenses during entire year are not charged against blister rust control activities.
New Jersey: One-fourth of state salary and expenses paid leader during entire year.
Pennsylvania: Arbitrary charge ($100. per month during January and February, $50. per month from March to August, and $47.50 from September to December) for assistance at Harrisburg office - general expenses at office.

B.P.I. Expenditures

Maine: Yearly salary and expenses from October to December of state leader.
New Hampshire and Massachusetts: Salaries of state leaders from January to August 21st - expenses of New Hampshire leader - part of salary of permanent clerk at each state office during same period.
Connecticut: One-fourth of state leader's salary and expenses during entire year.
Rhode Island, New Jersey, and Pennsylvania: One-fourth of state leaders' salaries from January to August 21st, and one-fourth of state leader's expenses in Pennsylvania during same period.

N.R.A. Expenditures (August 22nd to December 31st, only)

New Hampshire and Massachusetts: Salaries of state leaders - expenses of New Hampshire leader and part of salary of permanent clerk at each state office.
Vermont: Expenses of Merrill while on blister rust control work.
Connecticut: Three-quarters of Riley's expenses.
Rhode Island, New Jersey, and Pennsylvania: Three-quarters of state leaders' salaries and expenses of leader in Pennsylvania.

EXPENDITURES OF STATE AND FEDERAL AUTHORITIES FOR VARIOUS ELECTION WEST
COUNTRY PROJECTS IN NORTHEASTERN STATES DURING THE CALENDAR YEAR 1933

(Basis for project costs)

General Supervision

State Expenditures

Maine and Massachusetts: Expenses for state leaders.
New Hampshire: Upkeep and maintenance of state car (current gas and oil) for state
leader - state salary of permanent clerk.
Vermont: Salary ($50.00 per month) and expenses of assistant State Forester Lock
for time spent on blister rust control work.
Connecticut: Expenses of State Cooperator Tilly while on blister rust control w
extraordinary part of salary for a permanent stenographer at New Haven office ($75.0
per month) - salary of temporary assistant at New Haven office from September t
December.
Rhode Island: One-fourth of expenses paid by state to leader - extraordinary charge
$25.00 per month for clerical assistance at Providence office - one-fourth of co
of automobile purchased for general use - one-half of Agent Hastie's salary dur
December.
New York: State Leader Nichols's salary and expenses during entire year are not
charged against blister rust control activities.
New Jersey: One-fourth of state salary and expenses paid leader during entire ye
Pennsylvania: Arbitrary charge ($100. per month during January and February, $50.
per month from March to August, and $47.50 from September to December) for assist
ance at Harrisburg office - general expenses at office.

B.S.I. Expenditures

Maine: Yearly salary and expenses from October to December of state leader.
New Hampshire and Massachusetts: Salaries of state leaders from January to August
first - expenses of New Hampshire leader - part of salary of permanent clerk at
each state office during same period.
Connecticut: One-fourth of state leader's salary and expenses during entire year.
Rhode Island, New Jersey, and Pennsylvania: One-fourth of state leaders' salaries
from January to August 31st, and one-fourth of state leader's expenses in Penn-
sylvania during same period.

B.E.P.C. Expenditures (August 22nd to December 31st, only)

New Hampshire and Massachusetts: Salaries of state leaders - expenses of New Hamp
shire leader and part of salary of permanent clerk at each state office.
Vermont: Expenses of Merrill while on blister rust control work.
Connecticut: Three-quarters of Tilly's expenses.
Rhode Island, New Jersey, and Pennsylvania: Three-quarters of state leaders'
salaries and expenses of leader in Pennsylvania.

B. R. C. Agent Activities

State Expenditures

All States:(except Maine and Conn.) - Cost of educational material purchased by states for use of agents.
New Hampshire: Rental of office space for Agent Richardson.
Vermont: Portion of Agent Palmer's expenses.
Rhode Island: Three-quarters of Hurford's expenses and cost of Agent White while on agent activities - three-fourths of cost of car purchased for general use.
New York: Agent Nichols' expenses.
New Jersey: Three-fourths of salary and expenses paid leader.
Pennsylvania: State Agent May's salary and expenses while on agent activities.

B.P.I. Expenditures

All States: Salaries and expenses of all permanent blister rust control agents (except expenses of Nichols in New York, and Boomer and Swain in New Hampshire) during period January to August 21st - cost of one new federal auto purchased for Agent Boomer in New Hampshire.
Rhode Island; New Jersey, and Pennsylvania: Three-quarters of each state leader's salary - expenses of state leader in Pennsylvania during period January to August 21st.
Connecticut: Three-quarters of state leader's salary during entire year and expenses during period January to August 21st.

N.R.A. Expenditures (August 22nd - December 31st)

All States: Salaries of all permanent blister rust control agents - expenses of all such men except Nichols in New York, and Boomer and Swain in New Hampshire.
Rhode Island, New Jersey, and Pennsylvania: Three-quarters of each state leader's salary - expenses of state leader in Pennsylvania.
Connecticut: Three-quarters of state leader's expenses.

Ribes Eradication - Other Than Nursery Sanitation and Black Currant Eradication

State Expenditures

All States,except New Jersey: Wages of owners' labor and state labor, state linemen, scouts, and foremen employed in pulling Ribes - transportation of crews and miscellaneous expenses for trail paper, picks, etc.

B.P.I. Expenditures

Maine, Vermont, and Massachusetts: Cost of temporary employees (scouts and foremen) on actual Ribes eradication work.

N.R.A. Expenditures

All States, except New Hampshire and New Jersey: Cost of laborers, scouts, straw bosses, and foremen while employed in pulling Ribes - transportation of crews.

F. F. C. Agent Activities

Field Operations:

All States: (except Maine and Conn.) - Cost of educational material furnished by cities for use of agents.
New Hampshire: Rental of office space for Agent Richardson.
Vermont: Position of Agent Palmer's assistant.
Rhode Island: Three-quarters of Crawford's clerkage and cost of Agent Mills while on Agent activities - three-fourths of cost of cars purchased for general use.
New York: Agent Nichols' clerkage.
New Jersey: Three-fourths of salary and expenses paid leader.
Pennsylvania: State Agent May's salary and expense while on Agent activities.

F.F.C. Temporaries

All States: Salaries and expenses of all permanent district rent & petrol agents (except expenses of Nichols in New York, and Doyle and Smith in New Hampshire) during period January to August 31st - cost of one new Ford sedan purchased for Agent Bonner in New Hampshire.
Rhode Island; New Jersey, and Pennsylvania: Three-quarters of each state leader's salary - expenses of state leader in Pennsylvania during entire year and expenses during period January to August 31st.
Connecticut: Three-quarters of state leader's salary during entire year and expenses during period January to August 31st.

F.F.C. Temporaries (August 32nd - December 31st)

All States: Salaries of all permanent district rent control agents - expenses of agents each except Nichols in New York, and Bonner and Smith in New Hampshire.
Rhode Island, New Jersey, and Pennsylvania: Three-quarters of each state leader's salary - expenses of state leader in Pennsylvania.
Connecticut: Three-quarters of state leader's expenses.

Tribe Tradition - Other Than Nursery Initiation and Place Current Indication

Tribe Operations

All states, except New Jersey: Wages of common labor and state labor. State timber, records, and forms employed in pulling Tribes - transportation of crews and miscellaneous expenses for trial paper, plots, etc.

F.F.C. Temporaries

Maine, Vermont, and Minor Connecticut: Cost of temporary employees (scouts and foremen on actual Tribe organization work.

F.F.C. Permanents

All States, except New Hampshire and New Jersey: Cost of laborers, scouts, storekeepers, and foremen while employed in pulling Tribes - transportation of crews.

E.C.W. Expenditures

All States: Cost of enlisted personnel's total time on Ribes eradication work figured at rate of $1.35 per eight hour man day - cost of transportation, when actual cost not available, figured at rate of $40. per month for each truck, plus 3¢ per mile for operating costs - actual cost of technical foremen's time on scouting work in all states except Vermont, Rhode Island, and New York where no such work was performed.

Nursery Sanitation

Cost for locating and eradicating Ribes within nursery sanitation zones - includes $500. allotment for general nursery inspection in Maine and $294.25 for inspection of white pine in Massachusetts nurseries - the cost in New Jersey includes a $16.87 state item and $22.50 B.P.I. charge to cover the time of Mott while eradicating Ribes in the state nursery - the E.C.W. expenditures in Connecticut and Pennsylvania are for the time of the enlisted personnel figured at the rate of $1.35 per eight hour man day.

Black Currant Eradication

State Expenditures

Massachusetts, Rhode Island, Connecticut, and New York: Wages and expenses paid to state men engaged in locating and eradicating Ribes nigrum when such work was conducted as a special project.

B.P.I. Expenditures

Connecticut: Cost of temporary agent Miller's time as foreman of state crew on special Ribes nigrum project - transportation costs of E.R.A. project during December.

N.R.A. Expenditures

Connecticut: Wages and expenses of N.R.A. personnel engaged in eradicating Ribes nigrum.

Supervision of Ribes Eradication

State Expenditures

New Hampshire: Cost of state checkers during May and part of June.
Massachusetts: Expenditures for state men supervising E.C.W. and N.R.A. projects.
Connecticut: Expenditure for state man supervising N.R.A. project.
New York: Cost of state foremen on E. C .W. control work.

B.P.I. Expenditures

Vermont: Cost of Smalley while supervising E.C.W. work during June.
Connecticut: Cost of Adams while supervising E.C.W. work.

W.C.A. Expenditures

Personnel: Cost of salaried personnel's total time on Tribe eradication work figured at rate of $1.75 per eight hour run day - cost of transportation, when actual cost not available, figured at rate of $45. per month for trucks, plus 7¢ per mile for operating costs - actual cost of insured foreman's time on scouting work in all states except Vermont, Rhode Island, and New York where no such work was performed.

Bureau Quotation

Cost for location and eradicating Tribe within bureau sanitation woods - includes $500. allotment for general sanitary inspection in Maine and $250.75 for inspection of white pine in Massachusetts nurseries - the cost in New Jersey included a $16.37 state item and $82.50 T.V.A. charge to cover the time of Scott while consulting Tribe in the state nursery - the C.C.C. expenditures in Pennsylvania are for the time of the enlisted personnel figured at the rate of $1.75 per eight hour run day.

Other Current Eradication

State Expenditures

Pennsylvania, Rhode Island, Connecticut, and New York: Wages and expenses paid to state men employed in locating Tribe on scouting work as a special project.

U.S.I. Expenditures

Connecticut: Cost of temporary guard William's time on foremen of state crew on special Tribe eradication project - transportation costs of W.C.A. project during December.

N.E.A. Expenditures

Connecticut: Wages and expenses of N.E.A. personnel engaged in eradicating Tribe infected.

Quarantine of Tribe Infection

State Expenditures

New Hampshire: Cost of state checkers during May and part of June.
Pennsylvania: Expenditures for state men supervising N.C.W. and W.E.A. projects.
Connecticut: Expenditure for state men supervising W.C.A. project.
New York: Cost of state foremen on E. C.W. control work.

U.S.I. Expenditures

Vermont: Cost of Stanley while supervising C.C.W. work during June.
Connecticut: Cost of Dunn while supervising C.C.W. work.

N.R.A. Expenditures

Maine and Vermont: Cost of N.R.A. supervisors and foremen's time while not on actual Ribes eradication work.
Massachusetts, Connecticut, and Pennsylvania: Cost of N.R.A. foremen's time while not on actual Ribes eradication work.

E.C.W. Expenditures

All States, except New Jersey: Actual cost (including any expenses) of E.C.W. technical foremen and checkers, except cost of time on scouting work.

Ribes Compensation

Costs paid by state, except in Vermont where one individual paid for the single claim.

Treatment Diseased Pines

State Expenditures

Maine and New York: Cost of locating and removing blister rust cankers in plantations or ornamental pines. The costs in Maine were paid by an individual co-operator.

N.R.A. Expenditures

New York: Cost of locating and removing blister rust cankers in plantations on public lands.

E.C.W. Expenditures

Maine: Cost of locating and removing blister rust cankers at Acadia National Park - cost of total time of enlisted men figured at rate of $1.35 per eight hour man day.

Field Data

State Expenditures

Maine: Cost of state men on strip line surveys and mapping work.
New Hampshire: Cost of state checkers' time from January to April, while engaged chiefly on special field studies.
Vermont, Rhode Island, Connecticut and Pennsylvania: State expenditures for state men on pine and control area mapping project.
New York: Cost of Littlefield, Snell, and their assistants on investigational work - state expenditures for pine and control area mapping.

N.R.A. Expenditures

All States, except New Jersey: Expenditures for temporary agents on pine and control area mapping project - cost of strip line survey work by N.R.A. personnel in Maine.

F.E.A. Expenditures

Maine and Vermont: Cost of F.E.A. supervisors and foremen's time while not on actual bridge erection work.

Maryland, Connecticut, and Pennsylvania: Cost of F.E.A. foremen's time while not on actual field preparation work.

C.C.C. Expenditures

All States, except New Jersey: Actual cost (including any expenses) of F.E.A. technical foremen and checkers, except cost of time on bonding work.

Other Corporations

Costs paid by states, except in Vermont were one individual paid for the direct claim.

Treatment Disputed Items

State Expenditures

Maine and New York: Cost of locating and removing filter rock caves in rivers or ornamental pines. The costs in Maine were paid by an individual co-operator.

U.S.A. Expenditures

New York: Cost of locating and removing filter rock caves in elevations on public lands.

C.C.C. Expenditures

Maine: Cost of locating and removing filter rock caves at Lovell Bridges - cost of total time of enlisted men figured at rate of $1.25 per eight hour man day.

Field Data

State Expenditures

Maine: Cost of state men on strip line surveys and mapping work.

New Hampshire: Cost of state engineers' time from January to April. Working entirely on special field studies.

Vermont, Maine Island, Connecticut and Pennsylvania: State expenditures for state men on pine and control tree mapping project.

New York: Cost at Litchfield, Cecil, and their associates on investigations work - state expenditures for pine and control tree mapping.

U.S.A. Expenditures

All States, except New Jersey: Expenditures for temporary assists on pine and control tree mapping project - cost of strip line survey work by U.S.A. personnel in Maine.

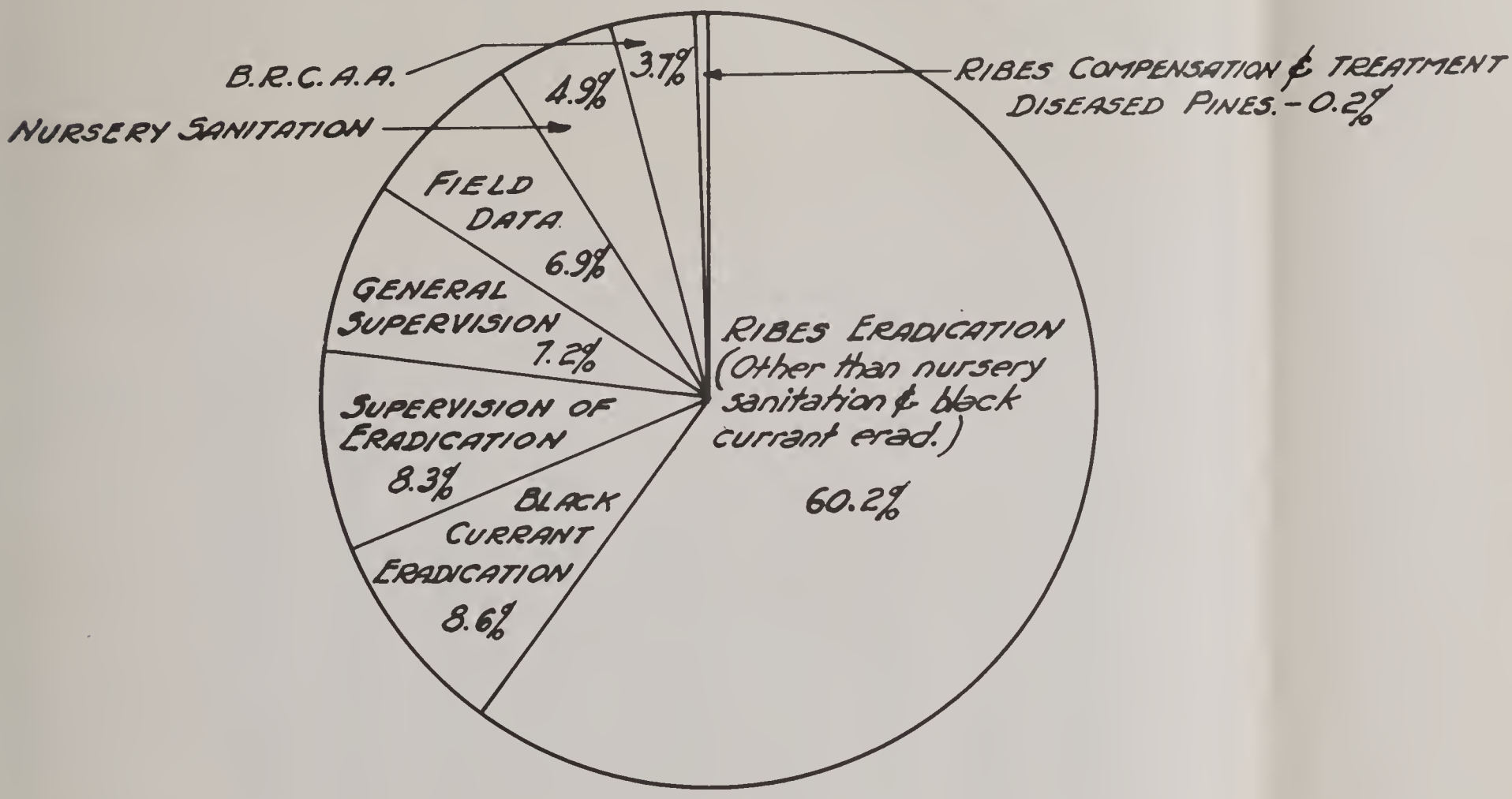
E.C.W. Expenditures

Maine, New Hampshire, Vermont, Connecticut, and Pennsylvania: Actual expenditures for E.C.W. checkers on pine and control area mapping project.

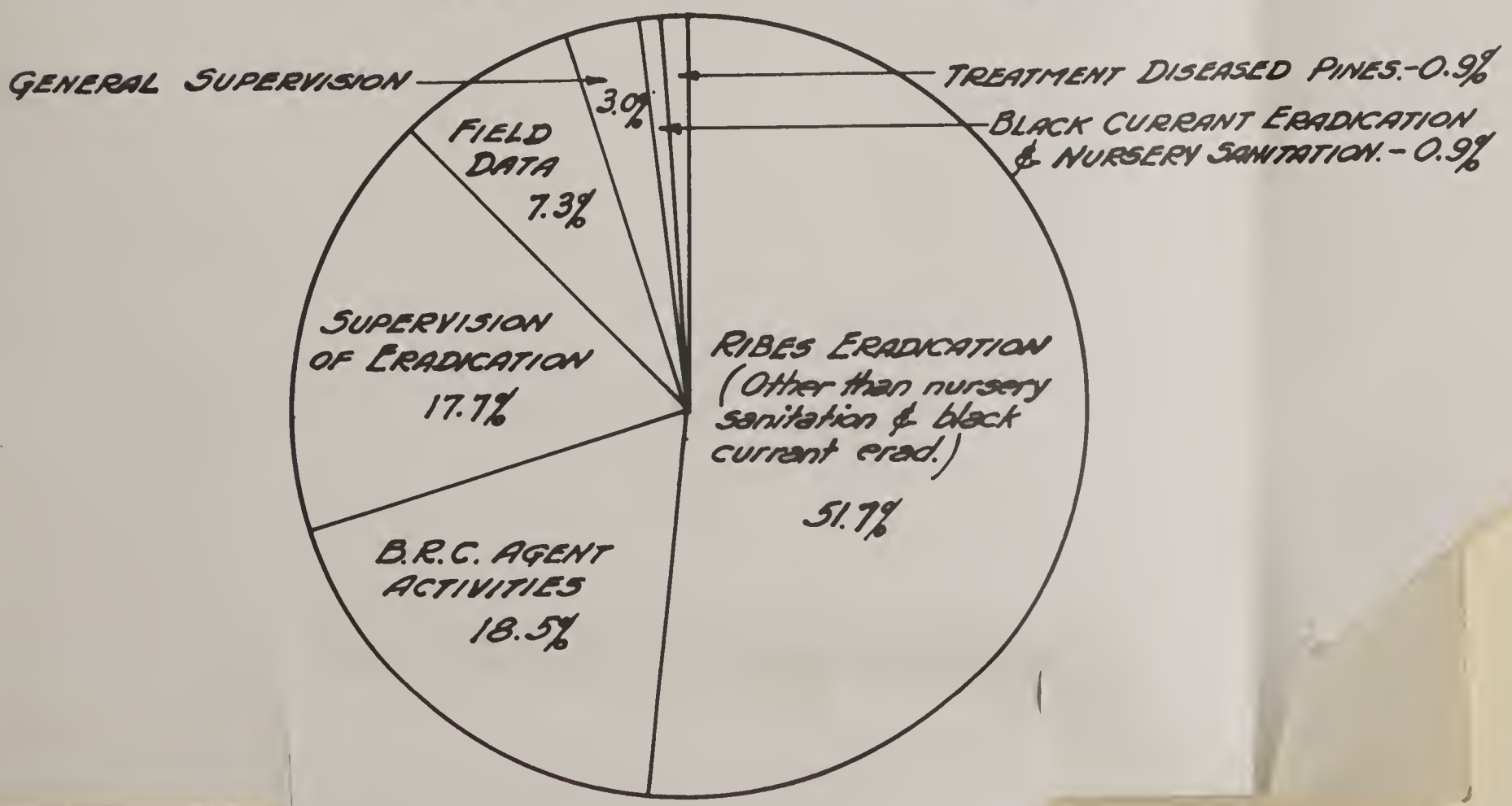
STATE & FEDERAL EXPENDITURES IN NORTHEASTERN STATES DURING CALENDER YEAR 1933

(Percentage of Total Spent on Each Project)

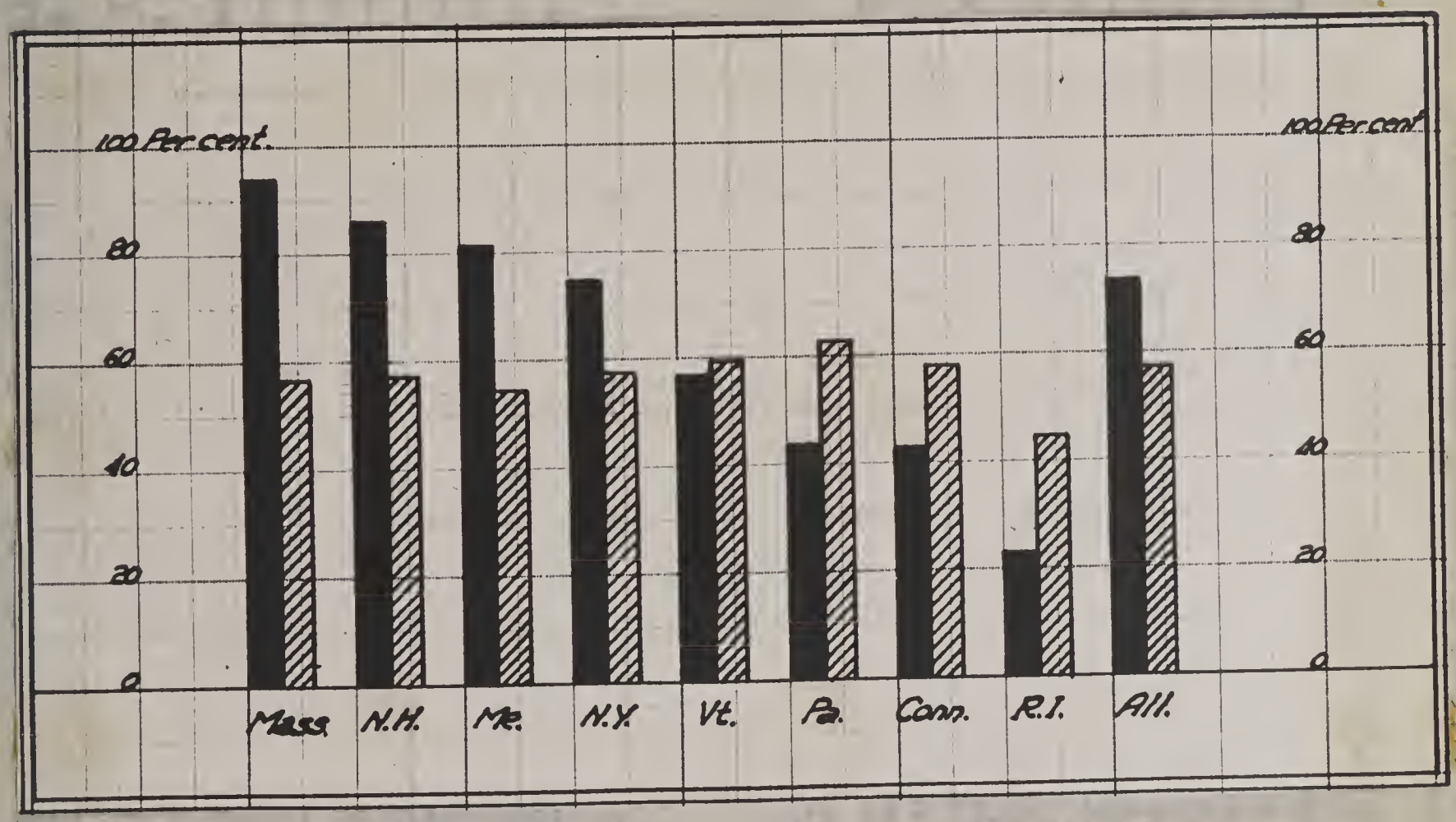
TOTAL STATE EXPENDITURES = $122,146.34



TOTAL FEDERAL EXPENDITURES = $410,679.13



PERCENTAGE OF TOTAL EXPENDITURES IN THE VARIOUS NORTHEASTERN STATES DURING 1933 USED FOR THE ACTUAL WORK OF LOCATING AND PULLING RIBES



State Expenditures

State and Federal Expenditures

Note: Includes regular Ribes eradication, black currant eradication, and nursery sanitation in all states except New Jersey.

State Expenditures

State and Federal Expenditures

Note: Includes regular Minor eradication, block current eradication, and Mercury sanitation in all states except New Jersey.

Table 54.-Total State Expenditures During The Calendar Year 1933 For The Various Blister Rust Control Projects in The Respective Northeastern States

State	General Supervision	B.R.C. Agent Activities	Ribes Erad.(1)	Nursery Sanitation	Black Currant Erad.	Super. of Ribes Erad.	Ribes Comp.	Treatment Diseased Pines	Field Data	Totals
Maine	1,192.62	-	6,630.58	726.85(2)	-	-	-	78.00	399.30	9,027.35
N.H.	1,850.99	94.39	21,572.78	111.55	-	347.89	-	-	1,201.22	25,178.82
Vt.	634.05	241.19	1,901.80	-	-	-	4.25	-	559.37	3,340.66
Mass.	478.93	16.37	9,220.17	1,278.61(3)	2,533.26	264.89	55.85	-	-	13,848.08
R.I.	1,381.87	758.29	-	445.06	326.11	-	-	-	335.14	3,246.47
Conn.	2,030.17	-	696.90	934.00	755.33	30.33	-	-	1,095.40	5,542.13
N.Y.	-	159.03	30,589.56	2,052.62	6,890.49	8,390.69	108.00	12.00	4,571.98	52,774.37
N.J.	400.97	1,203.00	-	21.87	-	-	-	-	-	1,625.84
Pa.	763.54	2,106.76	2,860.06	420.73	-	1,103.69	-	-	307.84	7,562.62
All States	8,733.14	4,579.03	73,471.85	5,991.29	10,505.19	10,137.49	168.10	90.00	8,470.25	122,146.34

Table 55.-Percentage of Total State Expenditures in Respective Northeastern States Paid For Each Project

State	General Supervision	B.R.C. Agent Activities	Ribes Erad.(1)	Nursery Sanitation	Black Currant Erad.	Super. of Ribes Erad.	Ribes Comp.	Treatment Diseased Pines	Field Data	Totals
Maine	13.2	-	73.5	8.0	-	-	-	0.9	4.4	100.0
N.H.	7.3	0.4	85.7	0.4	-	1.4	-	-	4.8	100.0
Vt.	19.0	7.2	56.9	-	-	-	0.1	-	16.8	100.0
Mass.	3.5	0.1	66.6	9.2	18.3	1.9	0.4	-	-	100.0
R.I.	42.5	23.4	-	13.7	10.1	-	-	-	10.3	100.0
Conn.	36.6	-	12.6	16.9	13.6	0.5	-	-	19.8	100.0
N.Y.	-	0.3	58.0	3.9	13.0	15.9	0.2	0.02	8.7	100.0
N.J.	24.7	74.0	-	1.3	-	-	-	-	-	100.0
Pa.	10.1	27.8	37.8	5.6	-	14.6	-	-	4.1	100.0
All States	7.2	3.7	60.2	4.9	8.6	8.3	0.1	0.1	6.9	100.0

(1) Other than nursery sanitation and black currant eradication.
(2) Includes $500. state appropriation funds used on general nursery inspection.
(3) Includes $294.25 expended for inspection of white pines in nurseries.

Table 54.--Total State Expenditures During the Calendar Year 1933 For The Various Welfare Rural Control Projects In The Respective Northeastern States

Control Supervision Activity	D.E.C. Assignment Field (1)	Salaries Field	Laboratory Facilities Used	Electric Current Used.	Number of Miles Trad.	Miles Demo.	Treatments Dispersed Rivers	Total Data	Totals
1,120.2	-	2,030.8	240.85 (2)	-	-	-	18.0	799.70	3,021.35
1,850.4	94.4	81.72.8	112.20	-	341.80	-	-	1,201.20	25,1/3.8
474.0	2412.14	1,201.80	-	-	-	4.25	-	1159.37	3,340.00
1,184.0	10.0	2,600.17	1,278.40 (1)	2,222.80	2614.80	55.45	-	-	12,348.08
1,025.0	124.00	-	1481.00	120.11	-	-	-	1325.14	3,280.42
1,020.11	-	1,020.00	624.00	2143.32	30.21	-	-	1,025.40	5,842.13
-	1,020.00	20,529.20	5,020.80	1,320.40	1,020.40	12.00	1,340.98	22,124.32	
-	124.02	30,229.20	5,020.80	1,320.40	-	-	-	1,252.84	
70.0	2,146.20	5,280.20	420.72	-	1,402.04	-	201.80	1,202.80	
1,252.40	3,124.02	72,472.82	10,202.42	10,202.42	10,172.42	128.10	90.00	8,472.02	122,148.32

Table 55.--Percentage of Total State Expenditures in Respective Northeastern States Field Work Project

Control Supervision Activity	D.E.C. Assignment Field (1)	Salaries Field	Laboratory Facilities Used	Electric Current Used.	Number of Miles Trad.	Miles Demo.	Treatments Dispersed Rivers	Total Data	Totals
12.2	-	16.5	0.0	-	-	-	0.2	4.4	100.0
1.2	0.4	35.1	0.4	-	1.4	-	-	4.2	100.0
14.0	7.2	56.2	-	-	-	0.1	-	10.2	100.0
2.5	0.1	80.0	2.2	10.2	1.2	0.4	-	-	100.0
12.5	82.4	-	12.1	10.1	-	-	-	10.2	100.0
5.6	-	12.0	10.2	12.2	0.2	-	-	18.6	100.1
-	0.2	52.0	2.2	12.0	12.2	0.2	0.02	8.2	100.0
4.2	12.0	-	1.2	-	-	-	-	-	100.0
0.1	22.6	32.6	2.0	-	14.6	-	-	0.1	100.0
1.2	2.1	60.2	4.2	8.2	8.2	0.1	0.1	6.2	100.0

Per diem allowance and field current projects.
Data appropriations funds used on general survey inspection.
Figure 60% extended for the portion of this phase in operation.

Table 56.-Total B.P.I. Expenditures During The Calendar Year 1933
For The Various Blister Rust Control Projects in The Northeastern States

State	General Supervision	B.R.C. Agent Activities	Ribes Erad.*	Nursery Sanitation	Black Currant Erad.	Supervision of Erad.	Sub-Totals	Furlough Deductions	Totals
Maine	3,170.92	6,156.60	422.65	-	-	-	9,750 .17	1,257.72	11,007.89
N.H.	2,152.80	9,665.55	-	-	-	-	11,818.35	1,429.68	13,248.03
Vt.	-	3,265.33	92.64	-	-	85.50	3,443.47	455.04	3,898.51
Mass.	2,158.86	7,352.33	369.75	-	-	-	9,880.94	1,255.21	11,136.15
R.I.	295.09	1,011.07	-	-	-	-	1,306.16	189.98	1,495.14
Conn.	876.17	2,647.42	-	233.04	855.90	1,116.31	5,728.84	801.65	6,530.49
N.Y.	-	15,424.09	-	-	-	-	15,424.09	1,775.05	17,199.14
N.J.	162.99	488.99	-	22.50	-	-	674.48	95.52	770.00
Pa.	429.72	3,073.61	63.80	36.80	-	-	3,603.93	373.71	3,977.64
All States	9,246.55	49,084.99	948.84	292.34	855.90	1,201.81	61,630.43	7,632.56	69,262.99

Table 57.-Percentage of Total B.P.I. Expenditures in Respective Northeastern States Paid For Each Project

State	General Supervision	B.R.C. Agent Activities	Ribes Erad.*	Nursery Sanitation	Black Currant Erad.	Supervision of Erad.	Totals
Maine	32.6	63.1	4.3	-	-	-	100.0
N.H.	18.2	81.8	-	-	-	-	100.0
Vt.	-	94.8	2.7	-	-	2.5	100.0
Mass.	21.8	74.4	3.8	-	-	-	100.0
R.I.	22.6	77.4	-	-	-	-	100.0
Conn.	15.3	46.2	-	4.1	14.9	19.5	100.0
N.Y.	-	100.0	-	-	-	-	100.0
N.J.	24.2	72.5	-	3.3	-	-	100.0
Pa.	11.9	85.3	1.8	1.0	-	-	100.0
All States	15.1	79.6	1.5	0.5	1.4	1.9	100.0

*Other than nursery sanitation and black currant eradication.

Table 26.-Total C.C.C. Expenditures During the December Year 1937
For The Various Districts Count Project in The Northeastern States

State	General Conservation	C.C.C. Camp Activities	Trees Prod.*	Nursery Sanitation	Insect Control Prod.	Super-vision of Prod.	Sub-Totals	Fighting Detection	Totals
Maine	3,340.42	6,252.00	[illegible]	-	-	-	9,592.42	1,458.72	11,051.14
N.H.	5,106.80	9,000.15	-	-	-	-	14,106.95	1,429.00	15,535.95
Vt.	-	3,258.32	92.8	-	-	87.85	3,438.97	487.04	3,926.01
Mass.	3,155.72	7,569.75	-	-	-	-	10,725.47	1,540.00	12,265.47
R.I.	255.89	4,011.07	-	-	-	-	4,266.96	580.38	4,847.34
Conn.	370.47	3,654-42	-	-	870.04	834.90	5,728.83-	801.23	6,530.06
N.Y.	-	13,000.00	-	-	-	-	13,000.00	1,774.18	14,774.18
N.J.	256.93	[illegible]	-	-	92.80	-	349.73	48.72	398.45
Pa.	993.72	4,001.84	63.1	-	73.80	-	5,132.46	724.14	5,856.60
Total	13,459.43	[illegible]	155.98	-	236.64	1,422.75	31,570.43	7,863.51	39,433.94

Table 27.-Percentage of Total E.C.C. Expenditures in Respective Northeastern
States Paid for Tree Project

State	General Conservation	E.C.C. Camp Activities	Trees Prod.*	Nursery Sanitation	Black Currant Prod.	Super-vision of Prod.	Totals
Maine	32.6	57.1	4.2	-	-	-	10.0
N.H.	12.2	61.6	-	-	-	-	100.0
Vt.	-	94.6	2.7	-	-	2.5	100.0
Mass.	21.6	74.4	3.5	-	-	-	100.0
R.I.	20.6	77.4	-	-	-	-	100.0
Conn.	13.2	44.2	-	4.1	14.7	19.3	100.0
N.Y.	-	100.0	-	-	-	-	100.0
N.J.	24.6	7.5	-	2.3	-	-	100.0
Pa.	11.4	53.3	1.6	1.0	-	-	100.0
Total	12.4	79.5	1.8	0.5	1.4	1.9	100.0

*Other than nursery sanitation and black currant eradication.

Table 58.-Total N.R.A. Expenditures During The Calendar Year 1933
For The Various Blister Rust Control Projects in The Northeastern States

State	General Supervision	B.R.C. Agent Activities	Ribes Eradication*	Nursery Sanitation	Black Currant Erad.	Supervision of Erad.	Treatment Diseased Pines	Field Data	Totals
Maine	-	3,382.97	5,229.20	-	-	1,257.14	-	1,517.59	11,386.90
N.H.	1,233.20	5,012.17	-	-	-	-	-	5,697.19	11,942.56
Vt.	15.35	2,569.61	9,049.73	-	-	371.27	-	579.83	12,585.79
Mass.	1,165.63	4,111.94	4,232.42	-	-	82.99	-	491.71	10,084.69
R.I.	159.92	914.15	627.72	-	473.80	-	-	333.15	2,508.74
Conn.	50.14	150.42	4,329.28	-	912.26	616.51	-	568.10	6,626.71
N.Y.	-	8,259.39	1,358.59	-	-	-	2,701.16	7,965.69	20,284.83
N.J.	91.37	274.13	-	-	-	-	-	-	365.50
Pa.	207.30	2,219.93	4,066.44	264.55	-	191.11	-	150.75	7,105.08
All States	2,922.91	26,894.71	28,893.38	264.55	1,386.06	2,524.02	2,701.16	17,304.01	82,890.80

Table 59. Percentage of Total N.R.A. Expenditures in Respective Northeastern States Paid For Each Project

State	General Supervision	B.R.C. Agent Activities	Ribes Eradication*	Nursery Sanitation	Black Currant Erad.	Supervision of Erad.	Treatment Diseased Pines	Field Data	Totals
Maine	-	29.8	45.9	-	-	11.0	-	13.3	100.0
N.H.	10.3	42.0	-	-	-	-	-	47.7	100.0
Vt.	0.1	20.4	71.9	-	-	3.0	-	4.6	100.0
Mass.	11.6	40.8	42.0	-	-	0.8	-	4.8	100.0
R.I.	6.4	36.4	25.0	-	18.9	-	-	13.3	100.0
Conn.	0.8	2.3	65.3	-	13.7	9.3	-	8.6	100.0
N.Y.	-	40.7	6.7	-	-	-	13.3	39.3	100.0
N.J.	25.0	75.0	-	-	-	-	-	-	100.0
Pa.	3.0	31.2	57.2	3.7	-	2.8	-	2.1	100.0
All States	3.5	32.5	34.9	0.3	1.7	3.0	3.2	20.9	100.0

*Other than nursery sanitation and black currant eradication.

State	Construction Activities	T.V.A. Activities	Price Regulation*	Mercury Production	Nickel Current Prod.	Copper-vision of Prod.	Treatment Process Plant	Pig Iron	Total
Ohio	–	7,752.07	5,264.50	–	–	4,651.14	–	1,241.21	1,341.40
N.C.	1,213.50	3,012.17	–	–	–	–	–	11,[illegible]	[illegible]
Va.	45.75	2,589.21	2,042.72	–	–	116.27	–	212.44	1,328.72
W.Va.	1,105.63	1,111.24	1,252.19	–	–	29.99	–	40.71	10,044.69
Ga.	159.46	614.15	821.75	–	471.80	–	–	772.14	3,310.14
Conn.	80.14	144.12	1,250.78	–	312.50	81.04	–	248.17	2,352.71
Ky.	5,252.10	1,748.05	–	–	–	2,704.14	–	1,401.02	10,324.83
Ill.	83.71	811.25	–	–	–	–	–	–	894.96
Pa.	2,015.25	4,045.44	264.21	–	114.11	–	–	140.18	7,105.18
Ind.	2,922.21	56,454.71	264.35	1,486.05	2,254.06	2,203.16	17,504.01	38,240.80	

Table 84.--2000 U.S.A. Tabulations During The Calendar Year 1933
For The Various States Over Which Projects In The Authority Exist

State	Construction Activities	P.W.A. Agent Activities	Price Regulation*	Mercury Production	Nickel Current Prod.	Copper-vision of Prod.	Treatment Process Plant	Pig Iron	Total
Ohio	–	75.3	45.3	–	–	11.0	–	12.2	100.0
N.C.	10.3	45.0	–	–	–	–	–	44.7	100.0
Va.	0.1	20.4	16.4	–	–	3.0	–	5.5	100.0
W.Va.	14.6	14.8	16.8	–	–	0.4	–	4.3	100.0
Ga.	4.8	16.4	24.0	–	14.4	–	–	15.3	100.0
Conn.	0.3	6.3	53.2	–	13.3	3.3	–	2.0	100.0
Ky.	–	40.7	0.1	–	–	–	12.3	47.5	100.0
Ill.	25.0	13.0	–	–	–	–	–	–	100.0
Pa.	1.0	13.2	27.2	–	3.7	–	–	3.1	100.0
U.S. Total	1.3	32.3	24.9	0.2	1.1	3.0	1.2	22.2	100.0

*Price from mercury monistic and bleedic current creditentics.

Table 60.-Total E.C.W. Expenditures During The Calendar Year 1933 For The Various Blister Rust Control Projects in The Northeastern States

tate	Regular Ribes Erad. Work	Nursery Sanitation	Supervision of Ribes Erad.	Treatment Diseased Pines	Field Data	Totals
aine	32,115.13	-	15,862.62	920.46	3,732.35	52,630.56
.H.	34,872.04	-	12,782.73	-	2,415.16	50,069.93
t.	8,248.30	-	3,809.92	-	902.48	12,960.70
ass.	6,031.61	-	1,870.21	-	-	7,901.82
.I.	3,902.88	-	1,984.47	-	-	5,887.35
nn.	11,602.41	519.45	5,430.11	-	463.60	18,015.57
.Y.	41,286.50	-	12,302.48	-	-	53,588.98
.J.	-	-	-	-	-	-
a.	44,503.15	189.95	15,011.62	-	5,398.27	65,102.99
11 tates	182,562.02	709.40	69,054.16	920.46	12,911.86	266,157.90

Table 61.-Percentage of Total E.C.W. Expenditures in Respective Northeastern States Paid For Each Project

tate	Regular Ribes Erad. Work	Nursery Sanitation	Supervision of Ribes Erad.	Treatment Diseased Pines	Field Data	Totals
aine	61.0	-	30.1	1.8	7.1	100.0
.H.	69.6	-	25.5	-	4.8	100.0
t.	63.6	-	29.4	-	7.0	100.0
ass.	76.3	-	23.7	-	-	100.0
.I.	66.3	-	33.7	-	-	100.0
nn.	64.4	2.9	30.1	-	2.6	100.0
.Y.	77.0	-	23.0	-	-	100.0
.J.	-	-	-	-	-	-
a.	68.4	0.3	23.0	-	8.3	100.0
.1 tates	68.6	0.3	25.9	0.3	4.9	100.0

Table 60.-Total W.C.D. Expenditures During The Calendar Year 1931 For The Various Winter Dust Control Projects In The Northwestern States

State	Regular Dates Treated. Work	Nursery Sanitation	Conservation of Elms Treated.	Treatment Diseased Trees	Field Costs	Totals
Minn.	$2,115.13	-	$ 16,606.82	420.45	$ 3,172.34	$ 22,314.74
[illegible]	70,576.04	-	12,782.13	-	2,418.12	85,776.29
[illegible]	6,048.70	-	3,809.92	-	498.48	10,357.10
[illegible]	6,021.31	-	1,870.21	-	-	7,891.52
[illegible]	3,005.35	-	1,954.47	-	-	4,959.82
[illegible]	11,208.41	$19.45	5,420.13	-	468.80	17,116.79
[illegible]	11,240.80	-	12,312.48	-	-	23,553.28
-	-	-	-	-	-	-
[illegible]	$ 107.15	189.80	15,011.82	-	3,293.27	$ 18,602.04
Total	$ 121,556.09	$ 209.40	$ 90,044.16	$ 420.45	$ 12,211.25	$ 224,441.35

Table 61.-Percentage of Total W.C.D. Expenditures In Respective Northwestern States For Each Project

State	Regular Dates Treated. Work	Nursery Sanitation	Conservation of Elms Treated.	Treatment Diseased Trees	Field Costs	Totals
Minn.	9.5	-	74.1	1.8	14.1	100.0
[illegible]	82.3	-	14.9	-	2.8	100.0
[illegible]	58.4	-	36.8	-	4.8	100.0
[illegible]	76.3	-	23.7	-	-	100.0
[illegible]	64.4	-	35.6	-	-	100.0
[illegible]	65.4	0.3	31.6	-	2.7	100.0
[illegible]	47.6	-	52.4	-	-	100.0
-	-	-	-	-	-	-
[illegible]	0.6	1.0	80.7	-	17.7	100.0
Total	54.2	0.1	40.1	0.2	5.4	100.0

Table 62.- Total State and Federal Expenditures During the Calendar Year 1933 for the Various Blister Rust Control Projects in the Respective Northeastern States

State	General Supervision	BRC Agent Act.	Ribes Eradi-cation *	Nursery Sanitation	Black Currant Eradication	Super-vision of Erad.	Ribes Comp.	Treatment Diseased Pines	Field Data	Totals
Maine	$ 4,363.54	$ 9,539.57	$ 44,397.56	$ 726.85	-	$17,119.76	-	$ 998.46	$ 5,649.24	$ 82,794.98
N.H.	5,236.99	14,772.11	56,444.82	111.55	-	13,130.62	-	-	9,313.57	99,009.66
Vt.	649.40	6,076.13	19,292.47	-	-	4,266.69	4.25	-	2,041.68	32,330.62
Mass.	3,803.42	11,480.64	19,853.95	1,278.61	2,533.26	2,218.09	55.85	-	491.71	41,715.53
R.I.	1,836.88	2,683.51	4,530.60	445.06	799.91	1,984.47	-	-	668.29	12,948.72
Conn.	2,956.48	2,797.84	16,628.59	1,686.49	2,523.49	7,193.26	-	-	2,127.10	35,913.25
N.Y.	-	23,842.51	73,234.65	2,052.62	6,890.49	20,693.17	108.00	2,713.16	12,537.57	142,072.27
N.J.	655.33	1,966.12	-	44.37	-	-	-	-	-	2,665.82
Pa.	1,400.56	7,400.30	51,493.45	912.03	-	16,311.42	-	-	5,856.86	83,374.62
All States	$20,902.60	$80,558.73	$285,876.09	$7,257.58	$12,747.15	$82,917.48	$168.10	$3,711.62	$38,686.12	$532,825.47

Table 63.-Percentage of Total State and Federal Expenditures in the Respective Northeastern States Paid for Each Project

State	General Supervision	BRC Agent Act.	Ribes Eradi-cation*	Nursery Sanitation	Black Currant Eradication	Super-vision of Erad.	Ribes Comp.	Treatment Diseased Pines	Field Data	Totals
Maine	5.3	11.5	53.6	0.9	-	20.7	-	1.2	6.8	100.0
N.H.	5.3	14.9	57.0	0.1	-	13.3	-	-	9.4	100.0
Vt.	2.0	18.8	59.7	-	-	13.2	-	-	6.3	100.0
Mass.	9.1	27.5	47.6	3.1	6.1	5.3	0.1	-	1.2	100.0
R.I.	14.2	20.7	35.0	3.4	6.2	15.3	-	-	5.2	100.0
Conn.	8.2	7.9	46.3	4.7	7.0	20.0	-	-	5.9	100.0
N.Y.	-	16.8	51.6	1.4	4.9	14.5	0.1	1.9	8.8	100.0
N.J.	24.6	73.8	-	1.6	-	-	-	-	-	100.0
Pa.	1.7	8.9	61.8	1.1	-	19.5	-	-	7.0	100.0
All States	3.9	15.1	53.7	1.4	2.4	15.5	0.03	0.7	7.3	100.00

*Other than nursery sanitation and black currant eradication.

Table 64.- Total State and Federal Expenditures During the Calendar Year 1971 for the Various Pollution Abatement Control Projects in the Respective Northeastern States

Total	Yield Data	Treatment Diagnosed Time	Blues Conv.	Super-vision of Prod.	Short Circuit Prediction	Buttery Depletion	Silver Evaluation	EPO Agent Act.	Total
$ 5,649,248	$ 326,784	$ 956.46	-	$21,123.76	-	$ 756.65	$ 1,371.56	$ 2,240.51	$ 4,347,774
99,000.65	9,713.57	-	-	13,193.65	-	123.55	5,444.92	15,122.71	276,390
2,042,750.46	2,042,750.46	-	4,555.50	4,555.50	-	-	19,045.47	6,045,715	2,042,750.46
$1,715.53	$1,715.53	-	-	5,516.26	2,521.40	1,274.40	11,852.45	11,480.64	11,480.64
$ 5,715.71	$ 5,715.71	-	-	1,555.00	1,224.47	1,510.00	1,857.51	1,857.51	1,857.51
$12,948.72	$ 6,003.20	-	-	720.01	1,224.47	1,510.00	1,857.51	1,857.51	1,857.51
$ 5,127.10	$ 5,127.10	-	-	1,122.36	1,224.47	1,510.00	1,857.51	1,857.51	1,857.51
$ 102,072.27	$ 12,547.12	$ 1,713.18	$ 1,756.00	$ 20,502.17	$ 6,810.40	$ 5,042.82	$ 27,845.65	$ 27,845.65	$ 27,845.65
$ 5,155.82	$ -	-	-	-	-	47.27	-	$ 1,045.23	$ 1,045.23
$ 57,374.82	$ 5,876.26	-	-	16,711.42	-	912.03	51,477.45	1,450.23	1,450.23
$ 4,356,574.12	$ 376,784.10	$ 4,713.18	$ 1,756.00	$ 96,911.18	$ 10,582.32	$ 11,241.58	$ 81,241.58	$ 98,243.54	$ 98,243.54

Table 65.- Percentages of Total State and Federal Expenditures in the Respective Northeastern States Paid for Each Project

Total	Yield Data	Treatment Diagnosed Time	Blues Conv.	Super-vision of Prod.	Short Circuit Prediction	Buttery Depletion	Silver Evaluation*	EPO Agent Act.	Total
100.0	5.8	1.2	-	20.7	-	0.9	23.6	11.2	3.7
100.0	3.4	-	-	13.3	-	0.1	27.0	14.9	5.7
100.0	6.3	-	-	11.2	-	-	29.7	16.8	4.0
100.0	1.2	-	0.1	5.3	3.1	-	47.3	21.3	1.1
100.0	3.3	-	-	18.3	4.4	2.4	35.0	29.1	1.2
100.0	3.9	-	-	20.0	1.0	4.7	46.3	1.9	1.2
100.0	8.8	1.9	0.1	14.5	4.9	1.4	52.6	15.3	-
100.0	-	-	-	-	-	1.6	-	12.8	1.5
100.0	7.3	-	-	19.5	-	1.1	61.5	7.6	1.7
100.00	7.5	0.7	0.03	15.5	2.4	1.4	34.7	13.3	4.0

* Buttery acetylation and block current predetection.

Table 64.- Total Cost of All Cooperative Blister Rust Control Activities In Northeastern States, 1918-1933, Inclusive

State	State BR Approp.	Funds from Other State Approp.	Town & County Funds	Individual Funds or Labor	Federal B.P.I. Expenditures	Park Service & Forest Service	Federal Emergency Funds (1933)		Totals
							E.C.W.	N.R.A.	
Maine	$ 87,112.25	$ 9,736.40	$ 89,977.26	$ 83,223.92	$ 246,801.30	$9,639.44	$ 52,630.56	$11,386.90	$ 590,508.03
N.H.	239,981.17	10,867.25	354,753.49	47,001.67	429,973.69	1,946.91	50,069.93	11,942.56	1,146,536.67
Vt.	50,333.14	-	1,197.91	71,209.37	118,024.16	-	12,960.70	12,585.79	266,311.07
Mass.	225,845.02	49,591.14	1,699.22	86,843.84	320,123.76	-	7,901.82	10,084.69	702,089.49
R.I.	43,172.38	2,013.83	-	581.36	43,568.83	-	5,887.35	2,508.74	97,732.49
Conn.	108,539.72	1,127.82	12,187.89	8,354.29	100,875.15	-	18,015.57	6,626.71	255,727.15
N.Y.	877,983.12	17,936.07	(County) 6,593.29	164,801.64	478,700.31	-	53,588.98	20,284.83	1,619,888.24
N.J.	8,843.73	27.20	-	-	6,271.28	-	-	365.50	15,507.71
Pa.	54,486.45	300.82	-	1,366.83	31,591.88	779.77	65,102.99	7,105.08	160,733.82
All States	$1,696,296.98	$91,600.53	$466,409.06	$463,382.92	$1,775,930.36	$12,366.12	$266,157.90	$82,890.80	$4,855,034.67

Table 64.- Total Cost of All Counterwire Military Mut Control Activities
In Northeastern States, 1916-1917, Thousands

Code	Funds from Other State Agencies	Items & Country Funds	Individual Funds or Labor	Federal B.I.I. Expenditures	Port Service & Items Service	Federal Emergency Funds (1933)		Total
						E.C.W.	T.R.A.	
1,112.54	$ 2,136.40	$ 89,211.66	$ 85,225.20	$ 246,801.70	$ 26,674.44	$ 52,670.60	$71,186.90	$ 590,558.92
1,981.17	16,867.25	746	41,003.47	429,971.69	1,945.09	40,065.97	13,645.56	1,146,576.67
773.44	-	1,341.21	73,209.71	118,284.16	-	12,960.70	12,884.70	265,371.01
4,542.62	40,221.44	1,024.22	56,242.84	150,127.76	-	1,901.82	10,044.69	702,269.49
1,76.40	2,012.85	-	581.76	14,446.83	-	5,817.75	5,508.74	21,726.40
4,254.76	4,127.85	16,187.65	6,341.24	100,415.15	-	14,017.47	6,646.71	232,127.15
963.15	12,376.07	6,321.24	105,801.64	178,103.71	-	32,108.72	20,284.63	1,619,885.84
18,807.13	93.45	-	-	83.673	-	-	145.49	18,807.13
1,460.73	30.007	-	3,100.05	32,081.48	172.12	6,102.82	7,100.04	1,460.73
24,645.67	64,001.43	3,466.40	3,412.36	16,173,278.16	1,313.76	2,766,127.80	382,820.80	24,645.67

(Courtesy)

Table 65.-Relation of Total Cost of All Control Activities to Total Commercial Value of White Pine in Northeastern States

State	Acreage of White Pine	Commercial Value of White Pine	Cost of All Control Activities*	Per Cent of Total Commercial Value Represented by Cost of All Control Activities	Per Cent of Total Control Area Protected	
					Initial	Re-Erad.
Me.	2,608,911	102,109,599	590,508.03	0.6	68.4	1.5
N.H.	1,544,033	68,919,198	1,146,536.67	1.7	86.3	12.1
Vt.	567,084	18,339,854	266,311.07	1.5	67.6	13.5
Mass.	958,564	44,257,012	702,089.49	1.6	97.3	23.2
R.I.	73,196	2,002,053	97,732.49	4.9	100.0	8.1
Conn.	216,154	10,240,416	255,727.15	2.5	95.8	31.7
N.Y.	1,315,957	57,127,222	1,619,888.24	2.8	64.5	8.2
N.E.& N.Y.	7,283,899	302,995,354	4,678,793.14	1.5	78.9	9.9
Pa.	375,628	12,475,437	160,733.82	1.3	14.9	5.3

*Includes federal emergency funds expended on control work during 1933.

The basis for acreages and values of white pine are given on pages 1 and 2.

The amounts listed under "Cost of All Control Activities" include the expenditures for the strictly federal control projects at Acadia National Park, White Mountain National Forest and Allegheny National Forest.

Table 05.--Selection of Total Cost of
Commercial Value of Mul

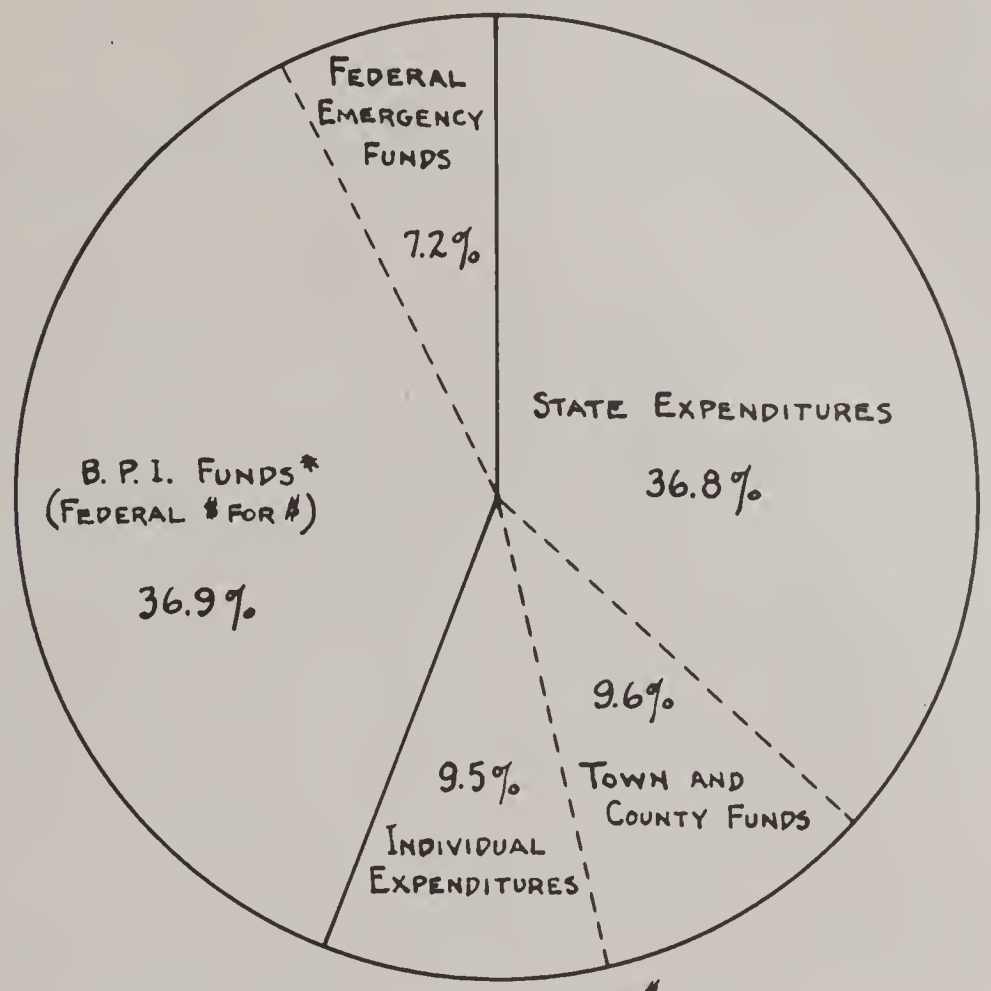
	Acreage of Unit Size	Commercial Value of Unit Size	Cost of Mu Control Activities
	3,038,971	102,109,999	[illegible]
	1,760,077	68,319,102	1,106,675
	521,054	18,349,864	[illegible]
	950,704	44,251,042	[illegible]
	77,156	5,002,058	[illegible]
	215,154	10,540,416	[illegible]
	1,415,957	1,127,252	1,[illegible]
	1,587,849	102,305,754	[illegible]
	375,658	12,[illegible]75,417	106,[illegible]

*Includes federal emergency fun

Fee basis for acreages and val

The amounts listed under "Cost
penditures for the strictly federal co
Mountain National Forest and Allegheny

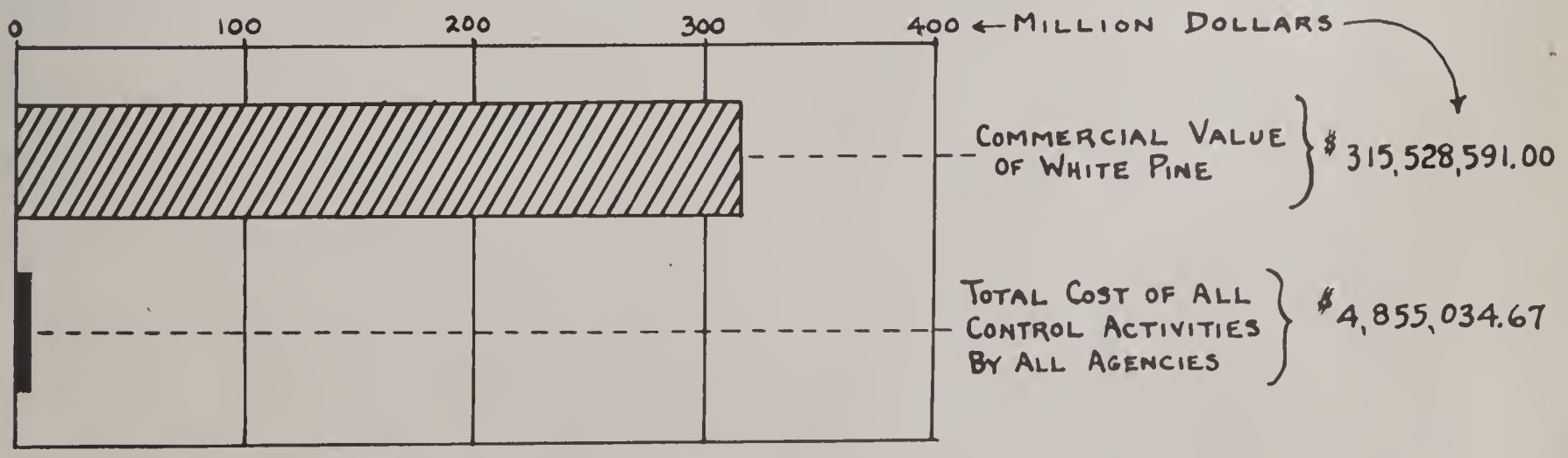
COOPERATIVE BLISTER RUST CONTROL EXPENDITURES IN NORTHEASTERN STATES 1918-1933



TOTAL EXPENDITURES - $4,855,034.67

* INCLUDES 12,366.12 BY FOREST AND PARK SERVICES.

RELATION
COMMERCIAL VALUE OF WHITE PINE TO TOTAL COST OF ALL CONTROL ACTIVITIES NORTHEASTERN STATES 1918-1933 INCL.



TOTAL CONTROL COST REPRESENTS 1.5% COMMERCIAL PINE VALUE.

COST OF CONTROL PER ACRE PER YEAR IN NEW ENGLAND AND NEW YORK (BASED ON TOTAL EXPENDITURES AND PINE AREA) EQUALS 6.0 CENTS.

Table .-Results and Cost of Ribes Eradication Project in Northeastern States (1918-1933, Inclusive)

State	Total Acreage Cleared of Ribes (Initial & Re-Erad.)	Estimated Acreage White Pine Protected		Est. Percentage Pine (in control area) Protected		Ribes* Eradicated (Wild & Cult.)	Total Cost** of Ribes Eradication	Total Cost of All Control Activities
		Initial	Re-Erad.	Initial	Re-Erad.			
Me.	2,879,235	1,217,460	26,369	68.4	1.5	22,221,576	286,163.44	590,508.03
N.H.	3,127,760	1,333,631	186,460	86.3	12.1	41,023,863	641,083.41	1,146,536.67
Vt.	244,962	81,666	16,318	67.6	13.5	2,597,943	112,205.34	266,311.07
Mass.	2,210,476	906,828	216,094	97.3	23.2	14,328,670	328,110.14	702,089.49
R.I.	295,377	73,196	5,927	100.0	8.1	216,505	36,768.95	97,732.49
Conn.	305,386	134,057	44,288	95.8	31.7	2,318,503	90,296.06	255,727.15
N.Y.	1,004,408	534,680	67,964	64.5	8.2	21,347,685	789,211.09	1,619,888.24
N.E.& N.Y.	10,067,604	4,281,518	563,420	78.9	9.9	104,054,745	2,283,838.43	4,678,793.14
N.J.	-	-	-	-	-	-	-	15,507.71
Pa.	109,938	32,492	11,483	14.9	5.3	5,416,251	83,170.78	160,733.82
All States	10,177,542	4,314,010	574,903	76.0	9.7	109,470,996	2,367,009.21	4,855,034.67

Note: Summary includes federal emergency funds expended on control work during 1933.

*Does not include bushes pulled in connection with special nursery sanitation and black currant eradication projects.

**Does not include cost of special nursery sanitation and black currant eradication projects.

The basis for estimating the acreages of pine protected in the various Northeastern States are given on Page 41A in the analysis of the status of control summary.

Table .-Results and Cost of Pines Eradication Project in Northeastern States
(1918-1933, Inclusive)

State	Acreage Cleared (Initial & Re-treated.)	Estimated Acreage White Pine Protected		Pct. Percentage Pine (in control area) Protected		Rights* Treated (Init. & Re-Treat.)	Total Cost** of Rights Treated (Init. & Re-Treat.)
		Initial	Re-Treat.	Initial	Re-Treat.		
[illegible]	2,479,275	1,211,409	268,709	48.4	1.5	[illegible]	285,164.44
[illegible]	3,121,150	1,233,643	459,460	49.3	12.1	41,023,891	941,063.41
[illegible]	204,962	61,668	15,718	67.6	13.5	6,327,413	112,203.74
[illegible]	2,210,476	706,324	216,004	32.3	27.3	14,328,014	324,110.19
[illegible]	295,371	73,193	5,921	100.0	8.1	210,505	5,[illegible]6.96
[illegible]	705,756	134,032	44,264	96.8	34.1	2,316,502	90,256.06
[illegible]	[illegible]	434,680	61,904	84.3	8.2	21,342,685	184,[illegible]2.03
[illegible]	10,067,604	4,281,518	561,920	78.9	9.9	104,054,748	2,287,274.43
[illegible]	-	-	-	-	-	-	-
[illegible]	32,492	11,483	1,683	14.9	5.3	5,416,251	83,140.18
Totals	19,117,845	6,944,010	574,903	76.0	9.7	109,470,996	2,357,229.43

Note: Summary includes federal emergency funds expended on control w during 1933.

*Does not include brakes pulled in connection with special nursery sta tion and black currant eradication projects.

**Does not include cost of special nursery sanitation and black currant eradication projects.

The basis for estimating the acreages of pine protected in the various Northeastern States are given on Page [illegible] in the analysis of the status of con summary.

Per Acre Values

(For Table 66)

State	Ribes Per Acre	Cost Per Acre							
		Based on Ribes Eradication Costs Only				Based on Total Expenditures			
		1918 - 1933		Ave. Per Year		1918 - 1933		Ave. Per Year	
		Total Area Worked	Pine Area Protected	Total Area Worked	Pine Area Protected	Total Area Worked	Pine Area Protected	Total Area Worked	Pine Area Protected
Me.	7.7	.099	.230	.006	.014	.205	.475	.013	.029
N.H.	13.1	.205	.421	.013	.026	.367	.754	.023	.047
Vt.	10.6	.458	1.15	.029	.072	1.09	2.72	.068	.170
Mass.	6.4	.148	.292	.009	.018	.318	.625	.020	.039
R.I.	0.7	.124	.465	.009	.029	.331	1.24	.021	.077
Conn.	7.5	.296	.506	.019	.032	.837	1.43	.052	.089
N.Y.	21.2	.786	1.31	.049	.082	1.61	2.69	.101	.168
N.E.& N.Y.	10.3	.227	.471	.014	.029	.465	.966	.029	.060
Pa.	49.2	.757	1.89	.151	.378	1.46	3.66	.292	.732

No satisfactory comparison can be made between the per acre costs in the various states, due to numerous factors which directly influence the cost of the eradication work. For instance, about 75% of the acreage worked in Maine has been covered by scouts. This has been possible because of the localized distribution of the Ribes. For this reason, the per acre costs in Maine are considerably lower than in the other states. It will be noted in Rhode Island that the cost per acre of pine protected is much greater than the per acre cost based on total area worked. A large acreage of potential pine land has been cleared of Ribes in that state. The small isolated pine areas in Vermont have necessitated larger proportionate protection zones, thus increasing the cost per acre of pine protected. In New York, the cost has been increased by the size and abundance of Ribes, the ruggedness of the topography, and the inaccessibility of many of the control areas.

The compilation of per acre values on the basis of total costs is hardly justified because they include expenditures for such projects as field investigations and black currant eradication, which are not directly related to the regular Ribes eradication work, particularly the latter cannot be figured on a per acre basis.

Per Acre Values

(For Table 5c)

Acre	Fiber Per Acre	Based on Fiber Production Only				Used on Total Production			
		1915 - 1922		Ave. Per Year		1913 - 1922		Ave. Per Year	
		Total Area Worked	Time Area Worked	Total Area Protected	Time Area Protected	Total Area Worked	Time Area Worked	Total Area Protected	Time Area Protected
1.	1.7	.529	.470	.044	.039	.317	.282	.029	.025
2.	14.1	.705	.443	.065	.041	.423	.266	.039	.025
3.	10.6	.548	1.15	.051	.107	1.69	2.72	.156	.252
4.	0.4	.148	.202	.014	.019	.089	.121	.008	.011
5.	0.1	.124	.405	.012	.038	.074	.243	.007	.023
6.	1.3	.209	.029	.019	.003	.125	.017	.012	.002
7.	21.2	.186	1.71	.017	.159	1.11	10.2	.103	.948
8.	10.2	.227	.172	.021	.016	.136	.103	.013	.010
9.	44.2	.171	1.89	.016	.174	1.03	11.3	.095	1.04

To satisfactory comparison can be made between the per acre costs in the various states, due to numerous factors which directly influence the cost of the protection work. For instance, about 75% of the acreage worked in Maine has been covered by roads. This has been possible because of the localized distribution of the fires. For this reason, the per acre costs in Maine are considerably lower than in the other states. It will be noted in Rhode Island that the cost per acre of pine protected is much greater than the per acre cost based on total area worked. A large acreage of rocky, pine land has been cleared of fires in that state. The small isolated pine areas in Vermont have necessitated larger proportionate protection roads, thus increasing the cost per acre of pine protected. In New York, the cost has been increased by the size and abundance of fires, the ruggedness of the topography, and the inaccessibility of many of the control areas.

The compilation of per acre values on the basis of total costs is readily justified because they include expenditures for such projects as fire inventories and block current protection, which are not directly related to the regular fires prevention work, particularly the latter cannot be figured on a per acre basis.

- 1933 -

ANNUAL REPORT OF BLISTER RUST CONTROL WORK

IN

SOUTHERN APPALACHIAN STATES

by

ROY G. PIERCE

ANNUAL REPORT FOR 1933

SOUTHERN APPALACHIAN DISTRICT

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Table A

BLISTER RUST CONTROL IN SOUTHERN APPALACHIAN STATES - RIBES ERADICATION DATA - 1933.

(Including Initial and Subsequent Eradication).

Table A

	Acreage white pine	Acres worked	Number Ribes pulled			Labor		Supervision		Supervision & labor		Acres worked		Number Ribes per acre
			Wild	Cultivated	Total	Man hours	Man days	Man hours	Man days	Total man hours	Total man days	Per labor man day	Per total man day	
NRA														
Maryland	190	1,890	187,444	26	187,470	2,128	266	400	50	2,528	316	7.1	5.6	99.2
Regular														
Virginia	1,141	2,591	6,514	0	6,514		28		7		35	92.4	74.0	2.5
ECW														
Georgia	8,161	8,851	0	0	0	12		28		40	737	221		00.00
N. Carolina	16,886	29,570	360		360	298		117		415	99.2	71.2		.012
S. "	888	888	0	0	0	11		10		21	80.7	42.2		0.00
Tennessee	5,932	10,720	62,832	40	62,872	269		113		382	39.8	28		5.8
Virginia	5,406	20,177	255,531	0	255,531	2,387		489		2,876	8.5	7.01		12
W. Virginia	675	4,256	60,748	0	60,748	484		151		635	8.8	6.7		14.2
E.C.W. Total	37,948	74,462	379,471	40	379,511	3,461		908		4,369	21.2	17.0		5.1
Grand total all programs	39,279	78,943	573,429	66	573,495	3,755		965		4,720	21.0	16.7		7.3

For costs, by States see Table B
For costs, by Programs, see Table C.

SUMMARY OF CONTROL WORK FOR 1933, BY PROGRAMS[1]

Southern Appalachian States
(Excluding Nursery Sanitation)

Program	Acres Erad. of Ribes	No. Ribes destroyed	Cost of Erad. Ribes	No. man days[2]	No. acres per man day	No. Ribes per acre	Cost per acre	Man days per acre
E.C.W.	74,462	379,511	$13,558.08	4369	17.0	5.1	$0.175	0.059
P.W. A.	1,890	187,470	1,684.95	316	5.6	99.2	0.891	.167
Regular	2,591	6.514	131.25	35	74.0	2.5	0.051	.014
Totals	78,943	573,495	15,374.28	4720	16.7	7.3	0.194	.060

[1]This table includes both initial and reeradicative work.

[2]Includes both labor and supervision.

Table B

BLISTER RUST CONTROL WORK IN SOUTHERN APPALACHIAN STATES UP TO AND INCLUDING 1933 - EXCLUDING NURSERY SANITATION

TABLE C

	1928 to 1931 inclusive			1932					1933					1928 to 1933 inclusive				
	Acres	No. Ribes	Cost	Acres	No. Ribes	Total cost	Per acres: Cost	Ribes	Acres	No. Ribes	Total Cost	Per acre: Cost	Ribes	Acres worked	No. Ribes	Total Cost	Per acre: Cost	No. Ribes
Initial work																		
Delaware	-	-	-	8	0	$3.50	0.437	0	0	-	0.0	0	-	8	0	$3.50	0.437	0
Georgia	-	-	-	-	-	-	-	-	8,851	0	162.65	0.184	0	8,851	0	162.65	0.184	0
Kentucky	-	-	-	-	-	-	-	-	0	0	0.00	0	0	0	0	.00	0.00	0
Maryland	-	-	-	809	1	26.35	0.033	0	1,890	187,470	1,684.95	0.89	90.9	2,690	187,471	1,711.30	0.632	60.9
North Carolina	-	-	-	-	-	-	-	-	29,570	360	1,828.48	0.061	.012	29,570	360	1,828.48	0.062	0.012
South Carolina	-	-	-	-	-	-	-	-	888	0	43.04	0.048	0	888	0	43.04	0.048	0
Tennessee	-	-	-	-	-	-	-	-	10,720	62,872	1,048.83	0.098	5.8	10,720	62,872	1,048.83	0.098	5.8
Virginia	3,773	13,586[1]	$384.66[1]	2248	16281	173.51	0.077	7.2	20,232	253,172	8,937.53	0.441	12.5	26,253	283,039	9,495.70	0.362	10.8
West Virginia	-	-	-	268	2	24.35	0.129	.01	4,256	60,748	1,332.75	0.314	14.3	4,524	60,750	1,357.10	0.300	13.4
Total for Region	3,773	13,586	$384.66	3324	16284	227.71	0.068	5.0	76,407	564,622	15,038.23	0.196	7.4	83,504	594,492	15,650.60	0.187	7.1
Reworked Areas																		
Virginia	414	0[2]	0[2]	600	19993	50.00	0.083	33.3	2,536	8,873	336.05	0.132	3.5	3,550	28,866	386.05	0.109	8.1
Total Initial and Reworked areas in Virginia	4,187	13,586	384.66	2,848	36,274	223.81	0.078	12.3	22,768	262,045	9,273.58	0.407	11.5	29,803	311,905	9,881.75	0.331	10.4
Total for Region including initial and reworked areas	4,187	13,586	384.66	3,924	36,277	277.71	0.071	9.2	78,943	573,495	15,374.28	0.195	7.3	87,054	623,358	16,036.65	0.184	7.1

[1] This includes some Ribes removed in reeradicative work; number bushes and cost, however, not being ketp separately.

[2] Data included under "Initial Eradication" in Virginia.

TABLE D

Table D

BLISTER RUST CONTROL IN 1933 BY STATE OWNERSHIP OF LANDS EXCLUDING NURSERY SANITATION.

State	Acreage worked — Federal Ownership — Nat. Forests	Nat. Parks	Total	State ownership	Private Ownership	Total Acreage Worked
Georgia	8,112	0	8,112	0	739	8,851
Maryland	0	0	0	430	1460	1,890
North Carolina	27,560	2,010	29,570	0	0	29,570
South "	425	0	425	0	463	888
Tennessee	8,895	1,825	10,720	0	0	10,720
Virginia	10,681	3,958	14,639	0	8,129	22,768
West Virginia	606	0	606	3,650*	*	4,256
Totals	56,279	7,793	64,072	4,080	10,791	78,943
			Number Ribes Pulled			
Georgia	0	0	0	0	0	0
Maryland	0	0	0	51,556	135,914	187,470
North Carolina	227	133	360	0	0	360
South "	0	0	0	0	0	0
Tennessee	62,856	16	62,872	0	0	62,872
Virginia	12,693	243,240	255,933	0	6,112	262,045
West Virginia	36,932	0	36,932	23,816*	*	60,748
	112,708	243,389	356,097	75,372	142,026	573,495
			Man Days Supervision and Labor			
Georgia	36	0	36	0	4	40
Maryland	0	0	0	137.5	178.5	316
North Carolina	376	39	415	0	0	415
South "	10	0	10	0	11	21
Tennessee	301	81	382	0	0	382
Virginia	620	2172	2792	0	119	2911
West Virginia	386	0	386	249*	*	635
Totals	1729	2292	4021	386.5	312.5	4720
			Cost of Control Work			
Georgia	$147.90	$ .00	$147.90	0	14.75	$162.65
Maryland	0	.00	0	615.96	1068.99	1684.95
North Carolina	1627.65	200.83	1,828.48	0	0	1828.48
South "	20.00	.00	20.00	0	23.04	43.04
Tennessee	848.68	200.15	1,048.83	0	0	1048.83
Virginia	1225.36	7656.02	8,881.38	0	392.20	9273.58
West Virginia	496.00	0. 00	496.00*	836.75*		1332.75
Total	4365.59	8057.00	12,422.59	1452.71	1498.98	$15,374.28

*Impossible to separate state land from private land.

SUMMARY OF PERSONNEL ON BLISTER RUST WORK - 1933
Appalachian States

E.C. W.		P.W.A.		FERA		Regular		Total	
No. camps	No. man	No. camps	No. men	No. camps	No. men	No.camps	No.men	Camps	Men
17	135	0	20	0	0	0	5	17	160

NURSERY SANITATION IN SOUTHERN APPALACHIAN STATES IN 1933[1]

State	Nursery	Location	Control Record: White pine in nursery	Acreage Examined	Man days	Ribes removed	Ribes not removed	Cost Record: Individual costs	State[2] costs	Federal[3] Costs	Total costs	Initial Or Reworking
Maryland	Gude Sons, A.	Ashton	5,000	186	0.5	15	0	$2.00	-)	$5.00	$7.00	Rework
	" " "	Derwood	200	186	0.5	0	1	0.00	-)			"
	Harrison Nursery	Berlin	1,000	186	1.0	3	0	0	-	5.00	5.00	Initial
	Ley's Nursery	Camp Springs	100	40	0.5	0	16	0	-	2.50	2.50	"
	Quaint Acres Nursery	Silver Springs	135	186	1.0	50	0	0	-	5.00	5.00	Rework
	Rock Creek Nursery	Rockville	529	186	2.0	0	23	0	5.00	5.00	10.00	Initial
	Rolandhurst "	Hebron	350	186	1.0	0	0		-	5.00	5.00	"
	Small & Sons, J.H.	Norbeck	3,744	186	1.0	8	8	4.00	-	5.00	9.00	Rework
	Towson Nursery	Towson	4,975	372	5.00	28	8	0	5.00	20.00	25.00	Initial
		Total	16,033	1,714	12.5	104	56	$6.00	$10.00	$52.50	$68.50	
Virginia	Alta Vista Nursery	Alta Vista	2,500	186	1.0	0	0	0	-	5.00	5.00	Initial
	Jones Nursery Company	Woodlawn	5,000	186	1.0	0	0	0	-	5.00	5.00	"
	State Forest Nursery	Charlottesville	No inspection in 1933									
	Titus Nursery Company	Waynesboro	2,700	280	7.0	101	Some at 3 places	2.00	-	19.00	21.00	"
	Westcott Nursery	Falls Church	14,585	200	1.0	0	0	0.00	-	5.00	5.00	"
			24,785	852	10.0	101	Several	$2.00	-	$34.00	$ 36.00	
West Virginia	U. S. Forest Service	Parsons	900,000	575	185.0	3,825	-	0	$10.00	293.13	303.13	
		Grand total	940,818	3,141	207.5	4,030	564	8.00	20.00	379.63	407.63	
Initial Work												
Maryland			6,954	970	95	31	47	0	10.00	37.50	4750	
Virginia			24,785	852	10.0	101	?	2.00	-	34.00	36.00	
		Totals	31,739	1,822	19.5	132	47	2.00	10.00	71.50	83.50	
Reworking												
Maryland			9,079	744	3.0	73	9	6.00	0	15.00	21.00	
West Virginia			900,000	575	185.0	3,825	-	0	10.00	293.13	303.13	
		Totals	909,079	1,319	188.0	3,898	9	6.00	10.00	308.13	324.13	
		Grand totals	940,818	3,141	207.5	4,030	564	8.00	20.00	379.63	407.63	

[1] Much of this inspection was carried on by Ralph A. Sheals of the Bureau of Plant Quarantine. However, the District Leader inspected 6 nurseries in Maryland, 2 in Virginia and one in West Virginia, a total of 9 out of 14.

[2] These state costs include cost of inspection of State inspector only when with Federal inspector, plus any compensation made by the states.

[3] Federal costs are estimated at $5.00 per day for inspectors Fracker, Sheals and Pierce, $4 per day for Inspectors Hodgkins, Stevens et al. For details of costs at Parsons Nursery, see under W.Va. in preceding pages.

R.G. Pierce, 3/18/35

NURSERY SANITATION IN SOUTHERN APPALACHIAN STATES 1928 to 1933 INCLUSIVE

TABLE G

INITIAL WORK		Control Record			Cost Record				
State	Number of Nurseries	Acreage Examined	Man days labor	Ribes removed	Individual	Town and county	State	Federal	Total
Delaware	1	160	1	0	0	0	$2.00	$2.00	$4.00
Maryland	10	9,196	26.5	48	$170	0	43.00	90.00	134.70
Virginia	5	2,862	13.0	101	200	0	5.00	44.00	51.00
West Virginia	2	2,585	34.5	5,648	0	0	[illegible].0	147.23	147.23
Total	18	14,803	75.0	5,797	$3.70	0	$50.00	$283.23	$336.93
Reworking									
Maryland	4	744	3.	73	6.00	0	0	15.00	21.00
Virginia	0	0	0	0	0	0	0	0	0
West Virginia	1	575	204.0	5,777	4.00	20.00	46.00	373.83	443.83
Total	5	1,319	207.0	5,850	10.00	20.00	46.00	388.83	464.83
All Work									
Delaware	1	160	1	0	0	0	2.00	2.00	4.00
Maryland	10	9,196	29.5	121	7.70	0	43.00	105.00	155.70
Virginia	5	2,862	13.0	101	2.00	0	5.00	44.00	51.00
West Virginia	2	2,585	238.5	11,425	4.00	20.00	46.00	521.06	591.06
	18	14,803[2]	282.0	11,647	13.70	20.00	96.00	672.06	801.76

[1]This acreage includes zone of one mile around Nursery scouted for R. nigrum.

[2]This acreage is the same as initial acreage.

R.G. Pierce,
3.8.35

INITIAL CONTROL WORK - 1928 to 1933.

TABLE H

Southern Appalachian States, 1928 to 1933, by Land Ownership
(Excluding Nursery Sanitation)

Ownership of land	1928 - 1931			1932			1933					1928 to 1933 inclusive				
	Acreage worked	No. of Ribes destroyed	Cost	Acreage worked	No. of Ribes destroyed	Cost	Acreage worked	No. of Ribes destroyed	Cost	Per acre Cost	Per acre No. of Ribes	Acreage worked	No. of Ribes destroyed	Cost	Per acre Cost	Per acre No. of Ribes
State and private lands	0	0	0	2,336	10,203	$ 119.40	13,715	213,886	$2,909.69	$0.212	15.6	16,051	224,089	$3,029.09	$0.188	14.0
National Forests	3,773	13,586	$384.66	988	6,081	108.31	54,899	107,347	4,071.54	0.074	1.9	59,660	127,014	4,564.51	0.076	2.1
National Park	0	0	0	0	0	0	7,793	243,389	8,057.00	1.034	31.2	7,793	243,389	8,057.00	1.034	31.2
Total	3,773	13,586	384.66	3,324	16,284	227.71	76,407	564,622	15,038.23	0.196	7.4	83,504	594,492	15,650.60	0.187	7.1

Ownership of land	1928 - 1931			1932			1933		
	Acreage worked	No. of Ribes destroyed	Cost	Acreage worked	No. of Ribes destroyed	Cost	Acreage worked	No. of Ribes destroyed	Cost
State and Private lands	0	0	0	Del. 8	0	$ 3.50	Ga. 739	0	$14.75
				Md. 800	1	26.35	Md. 1890	187,470	1,684.95
				Va. 1388	10,201	78.25	S.C. 463	0	23.04
				W.Va. 140	1	11.30	Va. 6973	2,600	350.20
				Total 2336	10,203	119.40	W.Va 3650	23,816	836.75
							Total 13715	213,886	2,909.69
National Forests	Va. 3,773	13,586	$384.66	Va. 860	6,080	95.26	Ga. 8,112	0	147.90
				W.Va. 128	1	13.05	N.C. 27,560	227	1,627.65
				Total 988	6,081	108.31	S.C. 425	0	20.00
							Tenn. 8,895	62,856	848.68
							Va. 9,301	7,332	931.31
							W.Va. 606	36,932	496.00
							Total 54,899	107,347	4,071.54
National Park	0	0	0	0	0	0	N.C. 2,010	133	200.83
							Tenn. 1,825	16	200.15
							Va. 3,958	243,240	7,656.02
							Total 7,793	243,389	8,057.00
	3,773	13,586	384.66	3,324	16,284	227.71			

SUMMARY OF INITIAL CONTROL WORK
Southern Appalachian States

1928 - 1933 (Excluding Nursery Sanitation)

Location Ownership	Estimated acreage of white pine	Estimated acreage in control area	Acreage cleared of Ribes	Percent of control area completed	No. of Ribes destroyed	Cost of Erad. Ribes	Per acre	
							Cost	No. of Ribes
State and private lands	715,500	3,647,000	16,051	0.44	224,089	$3,029.09	$0.188	14.0
National forests	354,050	1,662,500	59,660	3.58	127,014	4,564.51	0.076	2.1
National parks	22,025	44,000	7,793	17.71	243,389	8,057.00	1.034	31.2
	1,091,575	5,353,500	83,504	1.56	594,492	15,650.60	0.187	7.1

BLISTER RUST CONTROL

IN GEORGIA

1933

Data by Roy G. Pierce, R. M. Beeman

and W. H. Wariner

GEORGIA

Policy

In 1933 the Federal government had no cooperative agreement with Georgia officials, hence no work was carried on in the State on private lands except where adjacent to Federal lands. It is the policy of the Government to secure such an agreement in the spring of 1934. Work in 1933 was, however, carried on in two national units, the Cherokee and Nantahala National Forest, reports on which are found in the following pages.

White Pine

Native white pine in commercial quantities is found in the northern counties of the States. One estimate places woodland with at least 5% of white pine at 143,000 acres. Of this are 50% or 71,500 acres are within the Cherokee and Nantahala National Forests. This leaves approximately 71,500 acres in private ownership. The four counties of Fannin (1,000 acres) Union (8,000 acres) Rabun (2,000 acres) and White (9,000 acres), are reported by Cope as having the largest stands of commercial timber. There are unknown but lesser quantities of white pine in the 13 counties of Towns, Habersham, Lumpkin, Dawson, Forsythe, Gilmer, Pickens, Cherokee, Murray, Gordon, Bartow, Whitfield and Catoosa, it is believed. There are few records of white pine being planted in Goergia. The State Forest nursery produces a few white pines, having distributed 1900 of this species in 1932. In 1932 according to Department of Commerce statistics, 697,000 ft. B.M. of white pine lumber was cut in the State valued at $20.02 per M ft. at the mill or $13,594.00.

Ribes

Native Ribes have not been located in the white pine counties except in Murray County. They have been found, however, within a few miles of Georgia in the Big Frog Mountains in Tennessee at elevations of 3,000 feet and upwards, and near McFarland, Tennessee, at about 1,100 feet elevation. Ribes have also been found in North Carolina in Clay and Macon Counties which join Towns and Rabun Counties in Georgia on the north. Ribes curvatum, a southern species, is native in Georgia and has been found on Stone Mountain near Atlanta less than 40 miles from the Cherokee Forest. A search for native Ribes in white pine areas in the Nantahala and Cherokee National Forests revealed not a single bush on 5,324 acres covered. This scouting was carried on in 6 counties, viz:-Fannin, Lumpkin, Murray, Rabun, Union and White.

Blister Rust

The blister rust of white pine has not been found in Georgia.

Nursery Sanitation

No work of this character has been carried on. It is planned to circularize the nurseries in North Georgia in the spring of 1934 to learn whether they have white pine, currants or gooseberries.

Black Currant Eradication

As far as I can determine the European black currant is practically unknown in the State. I have no data on a single planting of this species.

Control Work in 1933 on National Forests

White Pine Timber

It is estimated that there are 71,500 acres within the Cherokee and Nantahala Forests having 5% or more white pine. The stand of saw timber in the Cherokee in Georgia was estimated at 7,769,000 ft. B.M., and in the Nantahala in Georgia at 3,576,000, a total of 11,345,000 ft. B.M. Mr. Beeman reports that"the Georgia District contains the greater portion of the white pine on the Cherokee Forest. It is continually evident that the light seeded white pine is taking advantage of the opportunity in burned and logged areas and abandoned fields to increase its distribution."

Personnel

Messrs. R.M. Beeman former blister rust control man in the northwest and Mr. W.H. Warriner also with previous blister rust control experience were detailed by the Cherokee and Nantahala National Forests respectively to take charge of blister rust control work. Most of their time was spent in Tennessee and North Carolina.

Plan of Work

Each blister rust checker trained men in their C.C.C. camps to recognize the various species of Ribes likely to be encountered and how to scout for the Ribes, then worked with them on the reconnaissance. On the Nantahala work was carried on in Georgia from 4 camps F-5 and F-6 near Clayton, Ga. and from F-9 at Lakemont, Ga. and from F-9 at Franklin, North Carolina. From 2 to 4 men including the checker worked from each camp. The scouting began on this forest September 25 and was concluded October 18. On the Cherokee work was carried on from to

On the Nantahala, 116½ man hours labor were expended, on the Cherokee O . On the former forest the checker spent 17 actual working days scouting, on the latter forest 5 working days.

Results Accomplished

On the Cherokee 1030 acres of white pine out of an area of 1720 acres worked, and on the Nantahala 7131 acres of white pine were scouted. This makes a total of 8161 acres of pine scouted and a total acreage worked of 8851. Of this 739 acres were privately owned. No Ribes, either wild or cultivated were found on either forest.

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Costs	Nantahala Forest	Cherokee Forest
Labor costs, 30.5 days @ $1 per day	$30.50	0
Transportation of men	19.24	0.
Supervision costs	89.25	23.66
Totals (spent on fed land 124.24; " " priv " 14.75)	$138.99	23.66
Grand total - - - - - - - - - -		162.65

Cultivated Ribes

Beeman reports "Ranger Woody of the Georgia unit (of the Cherokee) says he has destroyed all cultivated Ribes on recently acquired land; he knows of no other on private land within the forest."

Future Work in the State

It is planned to carry on blister rust control reconnaissance in Georgia using the agents and laborers as needed as soon after April 1, 1934 as possible. This work will be primarily on non-federal lands. The State leader will coordinate this work with work already carried on on National Forests and work which they may carry on in these forests.

RGP:cjp

4/5/34

Name of town where camp located and F.S. camp number				Clayton, Ga. C.C. Camp F-6	Clayton, Ga. Camp F-5	Lakemont, Ga. Camp F-9	Franklin, N.C. Camp F-9				Totals for State
No. towns where erad. performed				1	2	1	1				
Period work performed				Oct. 1-7	Oct. 9-11	Oct. 16-18	Sept. 25-28				
Ave. No. enlisted men per day				2	1½	1	3				
No. tech. foremen and checkers				1	1	1	1				
Results of Ribes Eradication Work*	Private Lands	Initial Erad.	Acreage erad.				739				739
			Ribes pulled: Wild				0				0
			Ribes pulled: Cult.				0				0
			Man hours enlisted personnel: Erad. Ribes				0				0
			Man hours enlisted personnel: Total time				15				15
		Re-Erad.	Acreage erad.								
			Ribes pulled: Wild								
			Ribes pulled: Cult.								
			Man hours enlisted personnel: Erad. Ribes								
			Man hours enlisted personnel: Total time								
	Public Lands	Initial Erad.	Acreage erad.	3886	110	298	2098				6392
			Ribes pulled: Wild	0	0	0	0				0
			Ribes pulled: Cult.	0	0	0	0				0
			Man hours enlisted personnel: Erad. Ribes	0	0	0	0				0
			Man hours enlisted personnel: Total time	47½	15	9	30				101½
		Re-Erad.	Acreage erad.								
			Ribes pulled: Wild								
			Ribes pulled: Cult.								
			Man hours enlisted personnel: Erad. Ribes								
			Man hours enlisted personnel: Total time								
	Totals (Initial and Re-erad.)		Acreage erad.	3886	110	298	2837				7131
			Ribes pulled: Wild	0	0	0	0				0
			Ribes pulled: Cult.	0	0	0	0				0
			Man hours enlisted personnel: Erad. Ribes	0	0	0	0				0
			Man hours enlisted personnel: Total time	47½	15	9	45				116½
Cost of crew transportation				5.20	4.40	5.08	4.56				$19.24
Technical Foremen and Checkers	Individual Scouting for Ribes		Acreage erad.	0	0	0	0				0
			Ribes pulled	0	0	0	0				0
	8 Hour Man Days On		Ribes scouting	0	0	0	0				0
			Crew work	5	2	2	4				13
			Supervision	1	1	1	1				4
	Wage Cost		Ribes scouting								0
			Crew work	26.25	10.50	10.50	21.00				$68.25
			Supervision	5.25	5.25	5.25	5.25				21.00
	Expenses										

*Under the sub-headings "Acreage eradicated" and "Ribes pulled" include both the work done by the enlisted personnel and the Ribes scouting performed by the technical foremen and checkers. However, under "Man hours" record only the time of the enlisted personnel.

NANTAHALA NATIONAL FOREST

4

SUMMARY OF ERADICATION WORK IN GEORGIA IN 1933

	NATIONAL FORESTS	PRIVATE LANDS	TOTAL ALL LANDS
Acreage Worked	8,112	739	8,851
Number of Ribes Pulled	0	0	0
Man Days Labor	-	-	12
Man Days Supervision	-	-	28
Man Days Supervision and Labor	36	4	40
Cost of Control Work	$147.90	$14.75	$162.65
Total Acreage of White Pine Protected	-	-	8,161
Acres Worked per Labor Man Day	-	-	737
Acres Worked per Man Day of Labor Plus Supervision	-	-	221
Cost of Scouting Work per Acre	-	-	0.018

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BLISTER RUST CONTROL

IN

MARYLAND

Calendar Year,
1933

by

H. E. Yost
State Leader

1933

Policy

The policy this year has been to make a beginning in systematic control work in the white pine districts of the State beginning in Garrett and Allegany Counties, the work to consist of pine and Ribes survey, Ribes eradication and blister rust survey.

Introduction

As prior to September, 1933 the blister rust control activities in Maryland were of an extensive nature, some space will be devoted to a description of the work and findings before this time. In the years from 1916 to 1920 inclusive, blister rust surveys were carried out under cooperative agreements between the United States Bureau of Plant Industry and the Maryland State Forester; for the first two years by Mr. E. R. Ford, and for the last three years by Mr. Charles E. Prince.

Periodic surveys were made in Maryland by members of the Division of Blister Rust Control, beginning again in 1928. Blister rust was evidently believed to be present but was not located until July, 1931. The first infection was found near Clear Spring, Washington County on Ribes americanum. During 1931 five centers of infection were found in Washington County and two centers in Allegany County, all but one of which were on Ribes. In 1932 the rust was found only at one center in Allegany County. In 1930 Mr. J. A. Cope made a survey to determine the distribution of native Ribes and white pine in the Southern Appalachian Region.

Blister rust was evidently becoming established in the State but no Ribes eradication work was being done except in connection with some nursery sanitation in the vicinity of Washington, D. C. and Baltimore. Plans were under way for intensive work, but no funds were available for it.

Acreage of White Pine

The following table shows, by counties, the estimated acreage of white pine and the area covered in preeradication surveys up to December 31, 1933:

County	Estimated Acreage White Pine	Estimated Acreage White Pine and Protection zone	Area Covered in Preeradication Surveys 1933	
			White Pine	White Pine and Protection zone
Garrett	8000**	12000	732	5000
Allegany	6000*	18000	14680	26520
Washington	1000*	2000		
Frederick	100**	1000		
Baltimore	500**	2500		
Montgomery	30**	1000		
Other Counties	50			
TOTAL	15680	36500	15412	31520

*J. A. Cope, 1930 **Roy G. Pierce, 1932

Stand of White Pine

The U. S. Forest Service estimated January 1, 1932 that there were 5,000 cords of white pine on cordwood areas, equivalent to 2,500,000 feet of saw timber worth at $2.50 per cord $12,500. Saw timber was estimated in millions of feet and no figures were given for Maryland.

Cooperation

The State Horticultural Department and the State Department of Forestry are cooperating with the U. S. Department of Agriculture in this control work, the State agreeing to expend about $1,000 and the Federal Government about $2,000.

Eradication Work

Early in September, 1933, $9500 of N. I. R. A. funds were allocated to Maryland , and eradication was started in areas that were known to require crew work. One crew of 8 men from the Garrett County relief list reported on September 20 for work. (At this date no National Reemployment list had been set up in Garrett County.) Two foremen, Messrs. Ray Porter of Oakland, and Lawton Friend of Shallmar reported. Due to rain no work was done until the 22nd, at which time the two foremen with the crew began work. Much time was spent on crew organization and methods. More emphasis was placed on thoroughness than speed. Both foremen were taught as much as possible during the 22nd and 23rd (Friday and Saturday). On the following Monday, the second crew was called out, being secured in the same manner as the first. Four men from crew No. 1 were placed in the second crew for one week thereby taking advantage of their two days' experience in teaching the new men.

During the first and second weeks, careful checks of the Ribes eradication were made, and I carefully supervised the work of the foremen and crews. Mr. Roy G. Pierce, of the Washington Office, after inspecting the completed work and observing the crews at work found a reasonably thorough job of eradication work, but not enough ground being covered per man-day. After the first three weeks the foremen were not only able to handle the crews satisfactorily, but showed reasonable skill at scouting and advance scout eradication. As the season progressed more emphasis was placed on reducing the cost per acre by increased speed of the crews and by advance scout eradication. If possible to secure the same foremen and laborers next season, a creditable showing should be made.

During the first two weeks, trail paper was used for marking the line. At the suggestion of Mr. Pierce string was tried out. The foremen reported that the string was by far the better. The string was visible at all times to practically the entire crew thereby greatly aiding the men in maintaining proper alignment. While using paper there was a tendency for the linesmen to use not enough paper especially when the crew was moving relatively fast. On the return trip considerable difficulty was often experienced in following it. Also, the last line made on Thursday, the last working day of the week, however heavy would frequently be very difficult to follow the following Monday when the crew work was resumed. When using a crew of 8 men at 50¢ per hour if only 15 minutes per day were saved by using string, it would be an economical practice. Throughout the remainder of the season we used string at all times excpet while working in skunk currant areas. Under these latter conditions the foremen had plenty of time to mark a line. The tendency of the men to work too close together was overcome to some degree by the use of string and to a greater extent by emphasising this point to foremen.

Where the crew work was comparatively light and the crew moved relatively fast the foremen found difficulty in covering a strip 80 feet wide and properly checking the work. This was overcome by taking the first man from the crew to follow one-half of the line and the foremen covering the other half. It was found that the crew of 7 men followed by two could cover as wide a strip or even more than 8 men in line followed by only the foremen.

All Ribes except skunk currants were hung in brush or trees. The men were encouraged to hang the bushes high enough so that the lowest branch was two feet off the ground. This was to assure that none would touch the ground and take root. The men were also instructed not to hang bushes in large crotches of a tree where they might take root in decayed bark or wood. Skunk currants were usually found growing in large patches and very thick, and in such cases they were burned after being pulled. No fires were built without the consent of the land owner and when the crew finished the area, one man was detailed to remain with the fire and to check over the area which had been cleaned. No fires were started after 3:00 pm, and before leaving the area in the evening the foremen were required to examine each fire spot and to see that the fire was entirely extinguished. Smoking was forbidden after 3:00 pm, and at all times when the leaves were dry or any fire hazard was present.

All the general statements concerning the habitat of Ribes were found true. Skunk currants were usually found growing only in damp, rocky places where moss was growing. Some, however, were found on top of ridges at Herrington Manor. Gooseberries were found generally distributed where the brush was not too thick. A very few were found growing under hemlock and white pine. They were small and would probably have never caused any serious infection. Several were found in large tree crotches and one was growing in the top of a partially decayed hemlock snag about 20 feet above

the ground. None were found growing in glades where alders and sphagnum moss were growing. On area No. 9, Oakland Quadrangle, owned by A. J. Kolbflesh near Oakland, on pastured land, a few Ribes were found growing. Most of them had large root systems but were small bushes. It is probable that continued pasturing coupled with watchfulness on the owner's part will completely eradicate them. A few large bushes were found in brush piles. Ribes were usually absent or very scarce in thorn and crabapple thickets. The usual number were found on and under partially decayed logs, at abandoned saw mills and home sites.

The following table shows the progress of the work during the eradication season:

Calendar week ending	Acreage Worked by Scout	Crew	Total Area Worked	Ribes pulled	Labor man-hours	Remarks
Sept. 23	0	45	45	584	105	Worked 2 days
Sept. 30	42	92	134	17678	444	2 Crews
October 7	51	75	126	36,230	498	"
October 14	141	371	512	16,512	520	"
October 21	340	724	1064	88,899	426	"
October 28	0	9	9	27,567	135	Worked 3 days
TOTAL	574	1316	1890	187,470	2128	

The total expenditures up to December 31, 1933 were $2212.91. This includes all salaries, wages, expenses, and supplies purchased in the field. Supplies purchased through the D. C. office amount to $40.34. The grand total of expenditures was $2253.25. The average cost of eradication, September 23 to October 28, was $0.85 per acre. Ribes averaged 94 per acre.

Checks were made of each area except the last one worked. This will be checked next spring as there was snowfall the day of completion, followed by cold weather which probably completely defoliated any remaining bushes.

The checking was done almost entirely by several 1/16 acre plots per area and general scouting. On three areas checked by Mr. Roy G. Pierce and the State Leader, it was found that 95% or more of the live stem had been pulled by the crew. These areas were No. 3, Victor Kelly near Crellen; No. 4 B., Harrington Manor; and No 6, State-owned land near Winters'.

Black Currant Survey and Elimination

No work of this character was carried on this year. From past records it is known, however, that there are or have been numerous scattered plantings of European black currants in the State. The known locations are as follows:

Allegany county at Barton, Frostburg, Midland, National, and in George Creek Valley.
Anne Arundel County at Winchester.
Baltimore County at Garrison, Lutherville, Riderwood, Ruston and Stephenson.
Garrett County at Oakland.
Montgomery County near Norbeck.
Washington County near Clear Spring.

Some of these locations were given by Messrs. Ford and Prince as early as 1917.

One small nursery, that of Mr. Hurlebaus at Aspen Hill, 2 miles south of Norbeck, is propagating Ribes nigrum on a fairly large scale, having 208 bushes in 1932. The black currants in this nursery are a menace to the white pines growing at the large nurseries at Norbeck, Rockville and Derwood.

Nursery Sanitation

Nine nurseries in Maryland have applied for permission to ship white pine interstate. Four are permitted to ship to infected states only. One was denied permission to ship any white pine, one was given an unlimited permit, and the others may ship to areas other than the southwestern states. It is, therefore, evident that much work remains to be done in Maryland in this line of blister rust control work. The work was carried on principally by the State Nursery Inspector, and the United States Department of Agriculture, Division of Blister Rust Control, and Bureau of Plant Quarantine cooperating. The following table is taken from the files of the Division of Blister Rust Control, report of the Bureau of Plant Quarantine, United States Department of Agriculture.

Nursery Sanitation Data (Q.63) - 1933
Eastern United States

	Results of Inspection			Action on Application			White Pine in Nursery		
Name & address of applicant	Blister Rust	E.B.C. (1 mi.)	Ribes (1500')	Approved	Denied	Pending	Age	Source	Remarks
Quaint Acres Nurs., Silver Spring, Md.	-	-	-	8-9-33. Except S.W. States			10 12 yr. (200)	?	
Rolandhurst Nurs., Hebron, Md.	-	-	-	8-7-33. Except S.W. States			3-4 yr. (400)	Jackson & Perkins	

//

Nursery Sanitation Data (Q. 63) - 1933

Name & Address of Applicant	Result of Inspection: Blister Rust	E.B.C. (1mi.)	Ribes (1500')	Action on Application: Approved	Denied	Pending	White P. in Nursery: Age	Source	Remarks
Small & Sons, J.H., Norbeck, Md.	-	-	Yes	8-10-33. To infected States			(3000)	Mostly from seed in nursery	All Ribes except "Snowden planting" removed.
Titus Nurs. Co. Baltimore, Md.				Dealers permit issued 9-27-33. To infected States					Branch nursery of Titus Nurs., Waynesboro, Va. W.Pine to be secured from latter branch.
Towson Nurs. Inc. Towson, Md.	1 pinus excelsa from Towson plat reported as infected.	-	Yes	10-5-33. To infected States					Permit applies to P. strobus only grown in Ashland & Towson plats. P. excelsa reported as apparently infected with B. rust by Forest Pathology. Some cult. Ribes to be removed.
Rock Creek Nurs., Rockville, Md.				Dealers permit 10-31-33.					Stock to be secured from "Stabler planting" from which Gude obtains stock. Pines shipped under permit must be 10 yrs. or older.
Ley's Nursery, Md. Camp Springs	-	-	Cult. R. in nursery		8-10-33.		5-15 yr. (150)	Purchased stock.	Owner does not want to eradicate cult. Ribes.
A. Gude Son, Co., Rockville, Md.	-	-	-	8-14-33. To infected States			4-20 yr. (5000)	Seed in nursery and near-by plantation.	Obtains some stock from "Stabler planting" which has been inspected and approved.
Harrison's Nurs. Inc. Berlin, Md.	-	3 just outside milestone		8-7-33. Except S.W. States			4-5 yr. (1000)	Greensboro, N.C.	

White pine is a favorite tree as an ornamental in Maryland. Inspector examining trees for blister rust in Rock Creek Nursery near Rockville, Md.

Pine Survey

At the close of eradication season the laborers and two foremen were dismissed leaving the State Leader as the only blister rust employe in the state. The principal work being locating and mapping all the white pine which meets the minimum standards. This work was continued in Garrett County until November 13, when due to unfavorable weather the work was begun in Allegany County. Nine areas consisting of 3110 acres were mapped in Garrett County. Adding this area to the area of 1890 acres worked by crew and scout, which were also mapped, makes a total of 5000 acres of pine land and protection area mapped. The white pine found in Garrett County may be divided into 4 classes; plantation, farm woodlot, forest, and ornamental. In the first class there are 12 known at present on which were planted slightly over 62,000 white pine. Most of these have been planted since 1928. The farm woodlot group is the most important as to value and acreage. Many are 10 to 20 acres in size and practically 100% pure stand. Much interest is shown by the majority of the owners of this class of pine. The forest type, privately-owned, is usually on ground which is being held by the owner for mineral only or frequently for want of a buyer. The owners of this class frequently have no interest in the pine and give it no attention. Despite this some of the land is growing excellent white pine. The ornamental class will be discussed later. Some of the white pine land, particularly the forest type is so heavily infested with Ribes that it would be poor economy to attempt blister rust control with the present known methods of eradication.

To date five areas in Allegany County including 14,680 acres have been mapped, principally in the drainage areas of Sideling Creek and Fifteen-Mile Creek. The elevation varies from about 500 feet at the Potomac River to 1600 feet at the crest of the mountains. The white pine is principally reproduction and immature, growing in oak and scrub pine. Members of the State Forestry Department state that white pine is definitely coming back in this section. It is found principally along streams up to the 700 foot elevation except on the northwest side of the hills where it is found up to 1500 feet or more. Considerable farm land has been abandoned within the last 20 years which is almost invariably growing scrub pine with about 1 to 5% white pine; the latter is usually coming through and may later replace the inferior species. In this area are also found abandoned orchards which have been growing oak and brush, and white pine is now coming through on the north and northwest slopes particularly on Big Ridge. This area to a great extent appears to be naturally free from wild Ribes. Some have been found along Sideling Creek at elevations from 600 feet up. Usually cultivated gooseberries and currants are found at abandoned home sites. The bushes were undoubtedly planted by the former residents. Natives frequently report gooseberries growing on a particular ridge but a thorough search failed to disclose any. Finally it was discovered that they were referring to a plant similar to the huckleberry and sometimes known as buckberry. Cultivated Ribes are found in practically every garden.

At the suggestion of Dr. C. E. Temple a proposed planting site at Stronghold on Sugar Loaf mountain, Frederick County, was scouted for Ribes. None were found but as it was inspected during the dormant season it is possible some may be present. The soil elevation and ground cover seemed to be ideal for Ribes. The ground will be scouted thoroughly next spring when the leaves are present. The owner, Mr. Gordon Strong, proposes to plant several thousand white pine next year if the ground is reasonably Ribes free. This land is now being developed into a beautiful park.

No intensive survey has been made as yet to ascertain the number of ornamental white pines found in towns, parks, and around homes, but casual observation shows that they are well worth investigation. Judging from the commercial cost of this class of trees according to Dr. Thurston of the Horticulture Department, University of Maryland, the value greatly exceeds that of the cultivated Ribes usually found in town gardens. This again indicates a need for more adequate state regulations on Ribes.

Ribes Survey

Investigations up to 1933 revealed the presence of the following native Ribes, most of which have been positively identified: americanum, cynosbati, glandulosum, hirtellum, and rotundifolium. Practically all of the native Ribes were found above 1000 feet elevation. The heaviest growthwas found above 2000 feet. Native Ribes were found to be fairly evenly distributed over Garrett County and in the higher elevations in Allegany, Frederick, and Washington Counties. While no survey was carried on in 1933 as a distinct project, investigations of Ribes distribution was always made in connection with the pine surveys as noted previously in this report. It is interesting to note that some pine areas in Oakland County were found Ribes-free. This freedom from native Ribes was noted last year in pine stands and plantations at Fort Frederick, near Big Pool, in Washington County, near Emmitsburg in Frederick County, at Loch Raven in Baltimore County, and at Rockville, Sandy Spring, and Silver Spring in Montgomery County.

Informational Activities

No intensive educational campaign has been launched, due to the lack of time. Plans are under consideration for this work during the month of February or March, 1934. However, 6 newspaper articles were published, 1 poster distributed, and 49 circulars were given to interested parties. A total of 152 recorded contacts were made and many others made by foremen and laborers of which no record was made.

State Regulations

The present state regulations covering blister rust control work are adequate for state-owned land but for other land are practically nil in so far as prevention is concerned. Work is under way to provide

additional state regulations, and it is hoped that it will be provided by the time the season opens in 1934. Thus far the work has been done entirely through cooperation with the pine-owner which has been excellent, but not perfect. In three cases near Oakland, objections were made by owners of cultivated Ribes who refused to allow their bushes to be removed. Under the present State laws no cultivated Ribes may be removed without the owner's consent, unless they are found infected with blister rust.

Future Work

Blister rust control work in the future may be considered under three heads; one is state-owned land, another privately-owned land, and third, educational work.

On state-owned land tentative arrangements have been made whereby the State leader will do the mapping, checking, and assume supervisory responsibility for the work. Laborers and foremen to be provided by the camps and paid from E. C. W. funds. All state-owned land and some privately-owned land within close proximity to the camps will be worked in this manner. The State leader will assist in training crews and foremen who will also serve as Scouts whenever practicable.

On privately-owned land the same general plan will be followed during the 1934 season as was used last fall. Work will be started with one crew on the white pine plantations at Nicola's place near Thayerville using insofar as possible the same men as were used last fall. Upon completion of this and other areas in the vicinity of Oakland, the laborers will probably be discharged and another crew hired in the new localities in other sections of Garrett County, but using, if possible, the same foreman. It is probable that some crew work will be required in the extreme western end of Allegany County near Dan's Mountain and Big Savage Mountain. In this event the other foreman who worked last fall will have a crew in this locality. Probably no crew work will be required in eastern Allegany County in the vicinity of Fifteen-Mile Town and Sideling Creeks. A scout should be secured and trained to cover this area and one or two laborers provided, if necessary. That part of Area 1, Paw Paw Quadrangle between Sideling Creek and the crest of Sideling Hill, Washington County, will be worked in the same manner as eastern Allegany County. The mapping in Garrett and Allegany Counties has not been completed but it is questionable if all of the white pine can be protected during the summer of 1934 with the present funds.

It is estimated that $7071 will be required during the period January 1 to June 30, 1934 , and $6812 for the remainder of the calendar year, 1934. The activities will be confined almost entirely to Garrett, Allegany, and the extreme Washington Counties.

Educational activities will be confined largely to white pine owners and highschool students, particularly the classes of Vocational Agriculture. Plans are not complete but as many other contacts as are possible will be made such as Granges, Farm Bureau Organizations, Boy Scout troops and any others that are possible to contact and are present. Beginning about this time, posters will be placed at suitable places. Several newspaper articles will be written chiefly for Garrett, Allegany, and Washington Counties.

Blister Rust Distribution

One new blister rust infection area was found last fall. In October during an inspection visit of Dr. J. F. Martin and Mr. H. N. Putnam, blister rust in the telial stage was found by Mr. Putnam on R. rotundifolium which had been pulled by the crew about one week before. There were about 20 bushes, probably 60%, infected south of the old Oakland-Crellen Road on the land of Mr. A. J. Kolbflesh. No disease was found on the white pine, but is probably present. This is the only infection found in Garrett County but others are probably present. Other infections found heretofore in Maryland are as follows:

Location	County	Owner	Infection on W.Pine	Infection on Ribes	Date Found	Eradicated
1.5 miles west of Oakland	Garrett	A.J.Kolbflesh		rotundi-folium	Oct. 1933	Yes
Shady Bower (on U.S.40)	Washington	D.Frank Hull		aureum	1931	No
Shady Bower	"	F.Heineman		nigrum	1931	No
Clear Spring	"	Mr. Seiberts		aureum	1931	No
Big Spring	"	C. E. Newkirk		aureum	1931	No
High Rock, ½ mi. north on Pen Mar-High Rock Road	"	Unknown	P. strobus	rotundi-folium	1931	No
Cave Town Twp. 2 mi. S.E. RR., Warner Gap Hollow Road	"	"		rotundi-folium	1931	No
Frostburg (RFD-1)	Allegany	Anton Strunts		Nigrum (6) sativum(2)	1931, 1932	No
" "	"	Mrs. Richey		nigrum (1)	1931	No
" "	"	D. W. Athey		nigrum	1931	No
" "	"	J. Strunts		nigrum (2)	1931, 1932	No
" "	"	Chas. Sigler		nigrum (1)	1931	No
Carlos Jct., ½ mi. west. About 3½ mi. south of Frostburg	"	Unknown		cynosbati..	1931	No
Catoctin Mt., 5 mi. from Frederick	Frederick	Leon Estabrook (Winchester) Plantation	P.* strobus		1931	No

* Mrs. Acree in letter of October 27, 1931 writes: "Show presence of mycelium which looks like that of Peridermium strobi and is same width but haustoria, the most distinguishing characteristic, not seen. Dr. Hedgcock, to whom I showed the slides, believes as I do, that this is Peridermium strobi, but without finding the haustoria can not positively identify it as such."

Summary and Conclusion

1. Maryland has approximately 16,000 acres (J.A. Cope's estimate) of land producing white pine (5% or more white pine). More than one-half of it is young enough to be readily killed or seriously damaged by blister rust.

2. The disease is definitely becoming established in the state. Blister rust has been found in Washington, Allegany, and Garrett Counties. (Found in Garrett County, 1933)

3. Wild Ribes are found abundantly over practically all of Garrett County and are present to a lesser extent in Allegany and Washington Counties. They have been reported although scarce in the other counties of the state north of D. C. and west of the Chesapeake Bay.

4. Cultivated Ribes are found in probably 90% of the gardens in the western four counties.

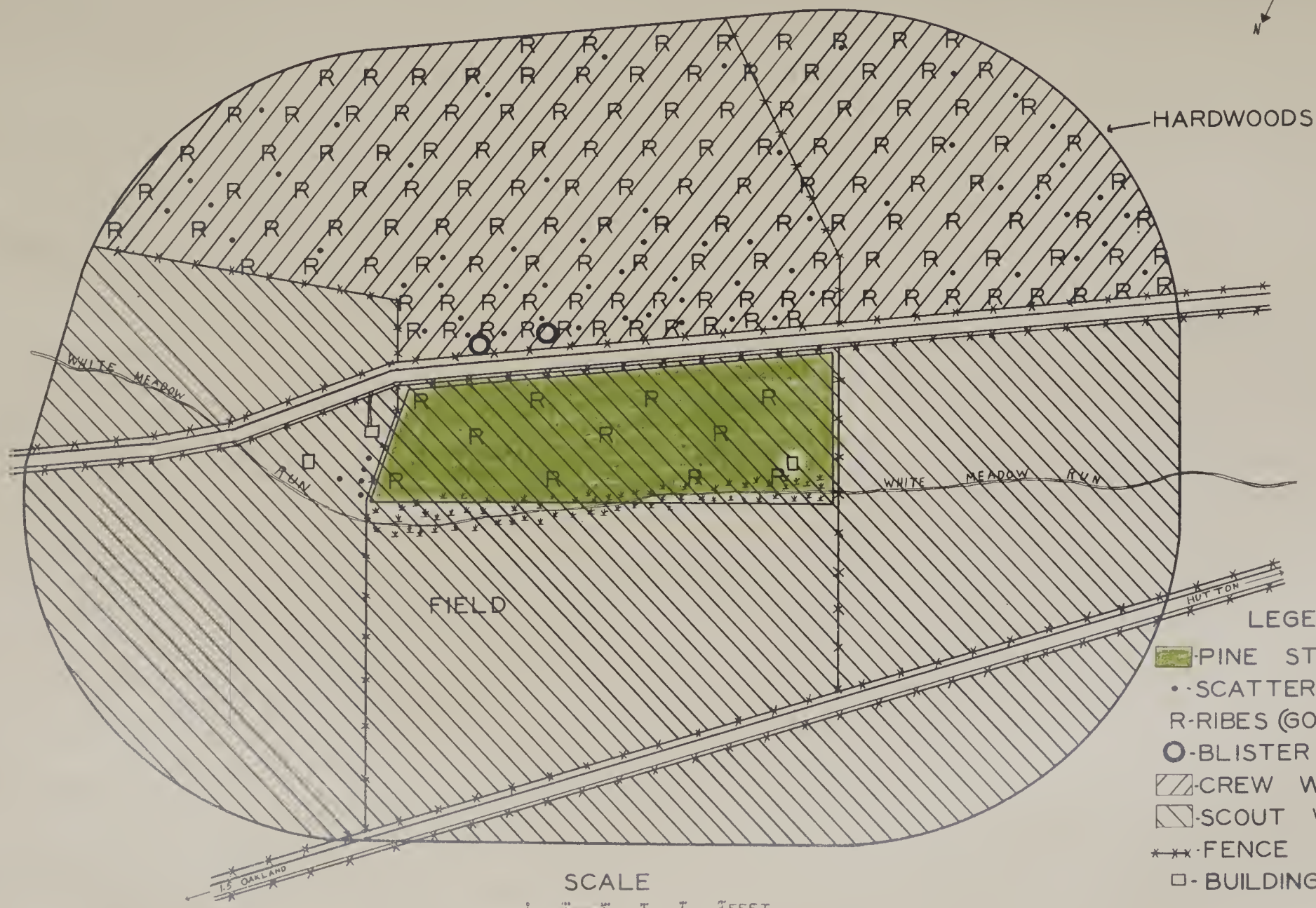
5. 1890 acres of land have been covered, on which over 175,000 Ribes were pulled. Many were skunk currants which partly account for the large number per acre. Average cost per acre, $0.85, average Ribes per acre 99.

6. Wild Ribes are scarce in eastern Allegany County and therefore the production of white pine should be encouraged there.

7. The greatest problem for the 1934 season seems to be cultivated Ribes, which in many instances will require State regulatory measures.

8. Ornamental white pine are found in appreciable amounts in many towns which deserve and will receive some consideration during the coming year.

MAP OF PINE LOT
A. J. KOLBFLESH, OAKLAND, MD.



SCALE

0 FEET

LEGEND

- PINE STAND
- · SCATTERED PINE
- R-RIBES (GOOSEBERRIES)
- O-BLISTER RUST
- CREW WORK
- SCOUT WORK
- FENCE
- BUILDING

12-27-33

MAP BY H.E.YOST- DEL. C.T.GEISER

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B. P. I. C.—4

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY

ANNUAL ~~MONTHLY~~ REPORT OF COOPERATIVE BLISTER RUST CONTROL WORK

Name _____ (Blister Rust Control Agent) *District* _____ *State* Maryland *Month* Sept. 13-Dec. 31 1933

EDUCATIONAL ACTIVITIES

	Number		Number
Roadside demonstrations placed	0	Window and Fair demonstrations placed	0
Publications distributed	49	Mimeographed articles distributed	0
Articles published (Including Duplications)	6	Posters and signs placed	1
Meetings addressed	0	Field demonstration meetings	0
Attendance		Attendance	

SERVICE ACTIVITIES

INITIAL INTERVIEWS				FOLLOW-UP CALLS				PERSONAL INSTRUCTION IN FIELD
	Classified by Purpose				Classified by Purpose			
Total Number	Eradication of Wild and Cultivated Ribes	Eradication of Cultivated Ribes Only	General Support Only	Total Number	Eradication of Wild and Cultivated Ribes	Eradication of Cultivated Ribes Only	General Support Only	Number of Individuals
152	50	0	102	10	9	0	1	18 (Crew

REGULAR CONTROL ACTIVITIES*

SUMMARY OF REGULAR RIBES ERADICATION WORK SUPERVISED BY AGENT								SUMMARY OF AGENTS' CHECKS			
Control Work Performed on	No. Control Projects	No. Acres Eradicated of Ribes	No. Wild Ribes Eradicated	No. Cultivated Ribes Eradicated	Cost to U.S. Individuals	U.S.	State	Number by Grade of Control Work Performed			
								Good	Fair	Poor	Total
Individual Projects	11	1450	135888 ~~125.6~~	26	L. 61150 F. 80			8	1	0	9
~~xxxxxx~~	One labor in Dec.					13.50					
State Projects by Individuals' Lands					L. 453			Number hours spent checking completed eradication work			21:45
State Projects by Public Lands	4	440	51.5 ~~55~~ 56	0	F. 72.50						

--Laborer, F.--Foreman.

SPECIAL CONTROL ACTIVITIES* 1250.50

NURSERY SANITATION							BLACK CURRANT ERADICATION						
No. Nurseries Worked	No. Acres Examined	No. Wild Ribes Erad.	No. Cult. Ribes Erad.	Cost to Individuals	Towns	State	No. Towns Worked	No. Patches Located	No. Bushes Located	No. Bushes Erad.	Cost to Individuals	Towns	State

Number crews employed 2 Number scouts employed 0 Hours spent by agent in field with crews and scouts 72:25

SUMMARY OF HOURS WORKED BY AGENT ON SUB-PROJECTS

EDUCATION		SERVICE		SUPERVISION		FIELD DATA		SCOUTING	OFFICE (Routine)	TRAVEL		TOTAL HOURS
Office	Field	Office	Field	Office	Field	Office	Field					
4	30		4:45	36:30	89:55	111	246:10	344:10	190:45	135:20	9:50	940 ¾

*If accurate figures are not available for current month, list estimates. Do not record data under "Special Control Activities" unless nursery sanitation and black currant eradication were performed as *special* projects under your direction.

U. S. GOVERNMENT PRINTING OFFICE: 1930 8—7205

U.S. DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

STATISTICAL REPORT OF BLISTER RUST CONTROL WORK UNDER N.I.R.A.

State MARYLAND Year 1933

								Totals For State
Name of District Agent								
No. towns where erad. performed								
Period work performed								
Personnel Employed	Laborers							16
	Crew foremen							2
	Scouts							0
	Checkers		Performed by State Leader.					0
	Supervisors							0
Results of Ribes Eradication Work — Private Lands — Initial Erad.	Acreage erad.							1450
	Ribes pulled	Wild					135888	~~125,900~~
		Cult.						~~5~~ 26
	Labor man hours							1256
	Supervision & Hr. days							37.5
	Cost of Ribes erad.							0.68(994.67)
Private Lands — Re-Erad.	Acreage erad.							
	Ribes pulled	Wild						NONE
		Cult.						
	Labor man hours							
	Supervision & Hr. days							
	Cost of Ribes erad.							
Public Lands — Initial Erad.	Acreage erad.							440
	Ribes pulled	Wild					51,556	~~1,565~~
		Cult.						0
	Labor man hours							869.5
	Supervision & Hr. days							22.5
	Cost of Ribes erad.							1.40(615.96)
Public Lands — Re-Erad.	Acreage erad.							
	Ribes pulled	Wild						NONE
		Cult.						
	Labor man hours							
	Supervision & Hr. days							
	Cost of Ribes erad.							
Totals (Initial and Re-Erad)	Acreage erad.							1890
	Ribes pulled	Wild					187444	~~187,465~~
		Cult.					26	~~526~~
	Labor man hours							2128
	Supervision & Hr. days							60
	Cost of Ribes erad.							0.85(1610.63)
Cost of crew transportation								0
Supervision (including district agents)	Total man days							168
	Cost	Salaries						712.50
		Expenses						416.76

Under "Supervision & Hr. days", include time spent by foremen, scouts, checkers, and supervisors while acting as crew foremen or Ribes scouts. This time should be included in figuring "Cost of Ribes erad."

SUMMARY OF EXPENDITURES FOR BLISTER RUST CONTROL

State Maryland

Calendar Year 1933

Table I.- Expenditures for General Supervision and District BRC Agent Activities

	Salaries				Expenses				Total Sal. & Exp.
	B.F.I.	N.R.A.	State	Total	B.F.I.	N.R.A.	State	Total	
General supervision									
BRC Agent act.									
Total									

Table II.- Expenditures by Programs for Control Projects Other Than General Supervision and BRC Agent Activities

	Projects		Ribes Eradication: Regular Control Work	Ribes Eradication: Special Control Work: Nursery Sanitation	Ribes Eradication: Special Control Work: Black Currant Eradication	Supervision of Ribes Eradication	Ribes Compensation	Treatment Diseased Pines	Field Data	Totals
UNIT A LOCAL COOPERATIVE WORK	Wages	State								
		B.P.I.								
		Total								
	Expenses	State								
		B.P.I.								
		Total								
	Total									
UNIT B E.C.W. PROGRAM	Wages	State								
		E.C.W.								
		Total								
	Expenses	State								
		E Transportation								
		C Subsistence								
		W Equipment								
		Total								
	Total									
UNIT C N.R.A. PROGRAM	Wages	State								
		N.R.A.	1287.00			240.00			313.50	1790.50 A
		Total								
	Expenses	State								
		N Transportation				70.22			112.19	182.41
		R Subsistence				93.75			139.50	233.25
		A Equipment	47.09							47.09
		Total								462.75
	Total		1334.09			403.97			565.19	2253.25 B

Estimated expenditures, calendar year, 1934 . . . $13,883

North Carolina Annual Report

The Pisgah National Forest.

Foreword

Prior to 1933 no work of blister rust control was carried on in the Pisgah National Forest, to my knowledge. Scouting for the rust itself, however, was carried on in the vicinity of the Forest on the Biltmore Estate and at other places during the years 1915, 1917, and 1918.

White Pine Stand and Acreage

The latest estimate, that of 1932, gives 60,000 acres of land in North Carolina, and 18,000 acres in Tennessee where white pine forms 5% or better of the stand. The stand of saw timber is estimated at 8,793,000 feet B.M. in North Carolina, and 5,290,000 feet B.M. in Tennessee. The Supervisor stated that most of the white pine was located in the Grandfather and French Broad Divisions and that in 1933 the work of blister rust control reconnaissance should be carried on only in these two Divisions. There are, I believe, some white pine plantations in the Pisgah Division.

Personnel and Organization of Work

In 1933 the presence of the E.C.W. camps in various divisions of the Forest afforded the opportunity of carrying on an intensive blister rust control reconnaissance. The Forest Service chose Mr. P.A. Swarthout, a forester with former blister rust control experience, and one of their cultural foremen to act as blister rust checker, and head up the work for the year. Mr. Swarthout, with the assistance of the Project Superintendents, chose and trained two scouts, each from the 4 camps in the Grandfather and French Broad Divisions, namely:

Camp F 5 at Mortimer, North Carolina.
Camp F 6 at Globe, North Carolina.
Camp F 7 at Hot Springs, North Carolina.
Camp F 8 at Cove Creek, Tennessee.

Mr. Swarthout in the following summary shows the work~~s~~ accomplished this year.

Mortimer Camp F-5, Caldwell County, North Carolina

Work started at this camp August 1, 1933. The Project Superintendent, Mr. Dupre, detailed a local man and one C.C. boy to the job. After a weeks training the scouts started the work on August 7.

During August the scouts covered 1210 acres protecting 540 acres of pine. They pulled 27 Ribes bushes and worked 184 hours.

In September they covered 2200 acres and protected 775 acres of white pine. They worked 168 man hours and pulled 7 Ribes bushes. A good part of the area covered during this month was area that had been planted in 1924. This pine is in very good condition and making good growth.

The work was stopped on account of frost October 11, 1933. During the month of October the scouts had covered 1500 acres protecting 480 acres of pine. They pulled 11 Ribes bushes. It required 50 man hours to do this work. They also discovered several locations of tame Ribes that they were unable to eradicate.

These locations are:

J. E. Webb property on the head of North Harpers Creek -- 25 bushes.

S. Gragg property on the head of Gragg Prong -- 1 bush.

McRae property on the extreme upper end of Gragg Prong -- Numerous bushes-growing wild.

North slopes of Big Lost Cove Cliffs -- Numerous bushes-growing wild.

(All locations are marked on the progress map.)

There is still a great deal to be done at this camp in the way of scouting and eradication. The scouts have covered Webb Prong, Rockhouse Creek, Gragg Prong, Big and Little Lost Cove Creeks, the heads of North and South Harpers Creek, and Dixon Spring Branch. The rest of the area still remains to be scouted. These areas are defined on the progress map.

1795 acres of white pine were protected requiring that 4910 acres of area had to be scouted. 45 Ribes were eradicated. 402 hours were needed to do this work.

Hot Springs Camp F-7. Buncombe County, North Carolina

Work started at this camp on August 14, 1933. Mr. Jones, the Project Superintendent assigned one local man, Barry Biggs, and one C.C. boy to the work. Their training period lasted one week and they started work August 21. They covered 620 acres during August and protected 200 acres of white pine.

In September the scouts covered a very large area of 6500 acres protecting 1841 acres of white pine. They found no Ribes in all this time.

The work was finished on October 6, 1933, the scouts covering 400 acres during October to protect 20 acres of pine. They found 6 tame gooseberries on the Dave Graham land on the French Broad River about 3 miles below Hot Springs. They were not able to get the owners consent to remove these plants.

In all they covered 7840 acres, protected 2221 acres of white pine and found only 6 bushes. They did not pull these. It required 264 hours to complete the work.

Globe Camp F-6. Madison County, North Carolina

Work started at this camp July 24, 1933. Mr. Graham, the Project Superintendent, detailed a local man to this work but later it was found that his services were needed badly by the Timber Stand Improvement crews and

another local man was detailed to the work, Charles Poore.

The scout started work August 1, and during that month he covered 1500 acres protecting 535 acres of white pine. He pulled 121 Ribes bushes working mostly in areas where they had escaped from cultivation. A second scout was added August 21. 92 man hours were needed to complete the work.

In September the scouts covered 2910 acres protecting 625 acres of pine. They pulled 28 Ribes bushes, all on private land. It required 214 man hours.

During the first week of October the scouts covered 1200 acres protecting 400 acres of white pine. The man hours were 62.

In all they covered 5610 acres and protected 1660 acres of white pine. They have pulled a total of 149 bushes. There are 4 locations on private land where they were unable to get the owners consent to remove the bushes. These locations are:

Cooper's Hollow on Henry Harrison's land — 54 bushes.

Apple Orchard Branch on Charles Cook's land — 50 bushes.

Cold Creek on Charles Ingram's land — 10 bushes.

Curtis Creek on Bolics' land — 3 bushes.

These locations are marked on the progress map for the Division and an effort to remove them at some future date will be made. With the exception of those bushes on the Henry Harrison property they do not constitute a very great hazard as they are outside the 900 foot area.

All that is left to be done at this camp is a small area on Boyds Branch near Blowing Rock and the area that lies to the east of the Mulberry Road.

Cove Creek Camp F-8. Greene County, Tennessee

Work started at this camp on August 8, 1933. Mr. Rainey, the Project Superintendent, selected two C.C. boys and assigned them to this detail. Their treining period lasted one week and they started scouting activities August 14.

During that month they covered 855 acres and protected 330 acres of white pine. They found no Ribes.

In September the scouts covered 1980 acres and protected 892 acres of white pine. They discovered a garden on Lower Paint Creek containing a number of tame gooseberries. This property belonged to Guy V. Roberts, of Marshall. They did not eradicate these bushes at that time.

During October, the men worked an area of 480 acres on upper Paint Creek, protecting 300 acres of white pine. They were also able to obtain the owners consent and remove the Ribes on Lower Paint Creek; there were 26 plants.

The scouts finished their area October 5, 1933.

In all they scouted 3315 acres protecting 1522 acres of white pine. This area all had pine composing better than 5% of the stand. They pulled 26 Ribes and completely covered the valuable stands of white pine on the Tennessee side of the French Broad Division. It required 238 man hours to complete the work. Their work was all satisfactory.

Table Showing Work Accomplished on the Pisgah National Forest in 1933, Including Time and Cost.

	Grand-father Division	French Broad Division	Totals for N.C.	French Broad Division. Cove Creek Camp, Tenn.	Totals for Pisgah in North Carolina & Tennessee.
tal area covered (acres)	10,520	7840	18360	3315	21675
tal area of pine protected (acres)	3,455	2221	5676	1522	7198
tal Ribes bushes found	337*	6	343	26	369
tal Ribes bushes eradicated	194	0	194	26	220
n hours required	770	264	1034	238	1272
urs of Supervision	283.5	98	331.5	91	472.5
st**on basis of hours worked (7 hrs. = 1 day)					
Labor - Scouts at $1 per day	$110.00	$38.00	$148.00	$34.00	$132.00
Supervision - Mr. Swarthout	222.75	77.00	292.75	71.50	364.25
TOTALS	$332.75	$115.00	$440.75	$105.50	$546.25
st** on basis of total wage salary received for whole riod of work, including ndays and holidays.					
Labor - Scouts at $30 per mo.	$273.00	$104.00	$381.00	$114.00	$495.00
Supervision			398.00	97.47	495.47
TOTALS			$779.00	$211.47	$990.47

lus numerous bushes on two properties.

No transportation charges included for Swarthout, reports "Scouts transported by Timber Stand Improvement trucks."

uture Work

From an examination of the data on white pine (5% and over) in the Forest in North Carolina and Tennessee and the data on pine areas scouted in 1933 it would seem that the scouting has only begun. The following table shows the above data and the areas not yet covered.

States	Acreage in white pine* (5% and over)	Acreage of white pine ** Scouted in 1933	Acreage of white pine not yet scouted
North Carolina	60,000	5676	54,324
Tennessee	18,000	1522	16,478
TOTALS ---	78,000	7198	70,802

* Data from Forest Supervisor, December 23, 1932.
** Data from P. A. Swarthout, November 1, 1933.

Some of the 70,802 acres remaining are in the vicinity of the Mortimer Camp, according to Swarthout, but of the location of the reminder I am in doubts. Swarthout and his scouts evidently believe that work is finished on the French Broad Division, for this statement is made concerning it: "This division is now in no danger of infection from white pine blister rust. The whole area should be checked in 5 years to make sure that no Ribes have come in or have been planted by local residents."

Records

Pine record sheets and maps were made by the scouts for each area covered. Copies were made for the Forest Supervisor and the Division of Blister Rust Control.

Roy G. Pierce,

Associate Pathologist.

NORTH CAROLINA ANNUAL REPORT

NANTAHALA NATIONAL FOREST

Foreword.

The Nantahala National Forest lies in the three States of North Carolina, South Carolina and Georgia, white pine occurring in each State within the Forest boundary. As far as known no blister rust control work has been carried on within the Forest prior to 1933. The advent of the Civilian Conservation Camps in 1933 made it possible to utilize several men in carrying on general blister rust control reconnoissance.

The following report by Mr. W. H. Warriner, Blister Rust Checker, covers the work very well. Mr. Warriner is a college graduate with a forestry degree and had already had one seasons experience in blister rust control work in the Northwest, I believe.

Following Mr. Warriner's report I have added a supplementary report.

REPORT OF WHITE PINE BLISTER RUST SURVEY ON THE NANTAHALA NATIONAL FOREST
BY WM. H. WARRINER, CULTURAL FOREMAN E.C.W.
OCTOBER, 1933

Introduction.

The object of the white pine blister rust survey on the Nantahala National Forest was to determine whether this disease was present. If so, control measures were to be carried on as the work progressed.

"Blister rust is the most destructive disease of white pine in this country. It was introduced into the United States early in the present century. In the East it is now known to occur throughout New England, as far south as Western Maryland and Northern Virginia, and throughout the Lake States. It affects all the eight species of five-needle pines native to this country."(1)

Blister rust is a disease of white pines caused by the parasitic fungus Cronartium ribicola. This fungus has two hosts, the white pines and the various species of the genus Ribes (gooseberries and currants). The disease cannot be carried from pine to pine, since it must go from the pine to the Ribes and thence to the pine. Roughly this is the life cycle of the fungus.

The main way of controlling this disease is by making a break in the life cycle of the fungus. This is done by destroying the Ribes bushes. It has been found that, by destroying all Ribes bushes within 900 feet of the white pine, ample protection is obtained.

Two species of Ribes are considered to be indigenous to the section covered. They are Ribes cynosbati and Ribes rotundifolium. Ribes cynosbati is easily distinguished by its prickly fruit and the gray or brown color of the young twigs. Ribes rotundifolium has smooth fruit, smooth internodes, 3-lobed leaves rounded at the base, and pubescent petioles.

There is a possibility of finding individual Ribes plants which have escaped cultivation growing with the white pine.

Acknowledgement is made for help given by the Supervisory Personnel, Rangers, Project Superintendents, and Cultural Foremen of the Nantahala National Forest, in the perfecting of this survey. Acknowledgement is also made of the aid given by Supervisor Byrne, Technical Assistant Stone, Dr. Geo. H. Hepting, Field Assistant, Division of Forest Pathology, Bureau of Plant Industry; Mr. Frank A. Albert, Assistant Supervisor, Nantahala National Forest, and Mr. Wm. Nothstein, Staff Assistant, Nantahala National Forest, in the writing of this report.

Planning the Work.

Instructions concerning the work were received from Mr. R. G. Pierce, Associate Pathologist, Bureau of Plant Industry, Division of Blister Rust Control, Washington, D. C., during his stay on the Forest and later by mail.

(1) Eastern Forest Tree Disease in Relation to Stand Improvement, ECW Publication No. 2, George H. Hepting.

Due to the fact that the section covered lies toward the southern limits of the range of the northern species of Ribes, and toward the northern limits of the southern species, the work seemed to be mainly a problem of scouting. Particular attention was to be paid to ridges, water courses, rocky areas, and talus slopes.

Conferences were held with the Supervisory Personnel and the Rangers of the Forest in order to line up the work and receive further instructions. According to the instructions received from the Supervisor, the work was to be confined mostly to stands in which the white pine comprised 25% or more of the total stems. If Ribes were to be found within 900 feet of such a stand, they were to be pulled by the scouting crew unless a special eradication crew was warranted.

The distribution of the white pine areas, and a list of the drainages to be scouted were obtained from Rangers Young and Nicholson. The rangers also gave directions for reaching these areas. All cultural foremen working on the forest were instructed by the Supervisor to be on the lookout for Ribes and to report any found. Only three such spots were found and reported by the cultural foremen.

Information was sought from local residents as to the location of white pine areas and also possible Ribes sites. About fifty to sixty contacts were made in this manner. About 25 publications were distributed.

A four inch to the mile map was to be kept as a progress map, showing the location of white pine areas, the range of elevation, and the areas scouted. From this map, two copies were to be made on a 3/8 inch to the mile scale showing the distribution of commercially important white pine areas on the Nantahala National Forest. One copy was to be for the Supervisor's Office and the other to be sent to Mr. R. G. Pierce.

Organization.

Men to be used were obtained through the cooperation of the Project Superintendents of the various CCC Camps. Where possible, only local men were used. These men knew the country to be covered and thus made the work go more smoothly. The men were first instructed by the cultural foreman in charge in the object of the work and how to recognize Ribes.

The following table shows the number of man-days and the acreage covered for each camp from which there was scouting:

Table I

Camp	Man-Days	Acreage
N.C. #9	111	12,790
Ga. #6	10	3,886
Ga. #5	3	110
S.C. #1	2	135
Ga. #9	2	298
Totals	128	17,219

As most of the work was to be done from CCC Camp F-9, the largest crew was used in this part of the work. Except for the first few days, the crew consisted of three local men and the cultural foreman.

A large part of the scouting was done by running strips back and forth across the areas. The entire crew worked together in this method. The men were lined up 20-25 feet apart in the running of the strips.

Another method of scouting was to divide the crew into two groups. One group included two CCC men and the other, one CCC man and the cultural foreman. At the beginning of each day, a route was decided for each group. The crews then separated and proceeded to scout the area assigned. A strip was scouted around the boundaries of each area as a protection strip. A few strips were then taken through the area, and probable Ribes sites were searched for bushes (ridges, rocky areas, talus slopes, etc.). The cultural foreman in charge took turn in working with each man. The larger areas were covered in this manner.

The scouting from the other camps was not quite so intensive, as the areas were smaller and more scattered. The range of the white pine seemed to reach its southern limit in South Carolina and near the Georgia Camps. Not more than two men were used from these camps, usually only one man. A strip was taken about each area and a few strips were run through the areas.

The mapping of the white pine was done by noticing the extent of the white pine by means of topographical features, such as ridges and streams. The areas were then drawn on the 4 inch to the mile maps. The acreages were determined by the use of a planimeter.

Results.

Explanation of the Tables.

The scope of the work is shown by the attached tables.

Table No. II deals with the scouted areas in which white pine comprised 25% or more of the stems in the stand. It shows the dates, the name of the locality, the approximate acreage of each area, the atlas sheet number and the percentage of stems in each age class. The age classes are expressed as new growth (0"-4" D.B.H.), second growth (5" - 14" D.B.H.), and old growth (15" and over D.B.H.)

Table No.III deals with the scouted areas containing less than 25% white pine in about the same manner as Table No. II. These areas contained some white pine in scattered lots and of all ages.

Table No. IV indicates places which were searched for Ribes due to the presence of possible Ribes sites.

Table No. V indicates places where Ribes were found in a wild state but with no white pine nearby. This table also shows the aspect, elevation, topography, forest type, and the species of Ribes found.

Results of the Work.

No wild Ribes were found on any of the white pine areas. Some cultivated Ribes were found on the Laurel Branch Plantation in Macon County, N. C., about 7 miles west of Highlands, N. C. It is on the Wayah Ranger District of the Nantahala National Forest. This plantation is about seventeen years old and is on the site of an old worn-out farm. The species of Ribes found was Ribes rotundifolium and had been part of the old garden. The Ribes plants were on the edge of the Plantation. Thirty-three plants were pulled.

During the scouting, special attention was paid to old farms and gardens in case of cultivated plants being left behind. These plants have either been removed or died out because none were found.

Many of the farms in the forest area have cultivated Ribes plants in the gardens. Some of these farms are in the white pine areas or within 900 feet of such areas. Ribes bushes on some of these farms were inspected but no infections were found.

TABLE II

Scouted National Forest and Adjacent Areas Containing 25% or more White Pine

Dates	Areas	Atlas No.	App. Pine Acreage Scouted.	Percentage of White Pine Age Classes by Stems		
				New Growth: 0"-4" D.B.H.	2nd Growth 5"-14" D.B.H.	Old Growth 15" D.B.H. & over
8/1-2	Skittles Creek	S-7	652.6	50	40	10
8/7	Chestnut Mountain	S-6A	387.4	40	50	10
8/14	Goldmine Rd.	S-7	9.8	75	15	10
8/14	Keener Place	S-7	351.4	20	60	20
8/15-16	Brush Creek	S-7	901.6	60	35	5
8/18	Laurel Br.	S-7	6.0	--	100	Plantation 17 yrs. (old
8/23,26,28	Horse Cove	S-6A	713.0	45	45	10
8/24	Glade Rd.	S-6A	144.8	50	50	--
8/25	Ammons Branch	S-6A	506.4	45	45	10
8/28	Queen Mtn.	S-6A	14.8	10	10	80
8/28,29	Clear Cr.	S-6A	787.4	20	60	20
Sept.8-16	Bull Pen	S-6A	2636.0	20	30	50
9/18-27	Blue Valley & Overflow country	S-5A*S5B, S-6A*S-6	4894.0	40	40	20
9/28-29	Burrels Ford	S-5-B, S-6A	400.0	40	50	10
Oct. 2	Tuckaluge Cr.	S-5A, S4-B	2348.0	40	35	25
10/3	Hood Cr.	S-5A, S4-B	1391.0	40	30	30
10/4	Walnut Fr.	S-4B		20	10	70
10/5	Sarah's Cr.	S-5A	107.0	60	35	5
10/6	Cliff Cr.	S-2B	40.0	10	10	80
10/10	Coleman River	N-1A	68.0	30	30	40
10/11	Tallulah River	N-1A	42.0	70	20	10
10/13	W. Village Cr.	S-4C	29.0	90	--	10
10/13	Chattooga R. & Ramey Ford	S-4C	50.0	60	30	10
10/13	Mill Cr.	S-3C	56.0	15	15	70
10/17	Stone Wall Cr.	S-3A	80.0	70	10	20
10/17	Fall Cr.	S-2A	18.0	60	40	--
10/18	Sawmill Cr.	S-3A	200.0	50	20	30
		Total	16744.2			

Scouted National Forest and Adjacent Areas Containing Less than 25% White Pine

Dates	Area	Atlas Ref.No.	Approx. Acreage	
July 18 Aug.3-4	Shortoff Mountain	S-7	92.6	These areas contain white pine of all ages well distributed over the area.
Aug. 10	Satulah Mountain	S-7,S6A	263.0	
Aug. 10	Fodder Stock Mountain	S-6A	29.2	
Total.....			384.8	

TABLE IV

National Forest & Adjacent Areas Scouted due to Presence of Possible Ribes Sites

Dates	Area	White Pine	Atlas Ref. No.	Ribes Found
July 27	Burningtown Bald	No White Pine	N-4C	None
Aug. 2	Lower Cullasaja Falls	" " "	S-7	"
Aug. 8	Glade Mountain	A little new growth	S-6A	"
Aug. 11	Osage & Scaly Mtns.	Scattered new growth	S-6	"
Aug. 21	Buck Creek(Cull.Riv.)	" " "	S-8	"
Oct.	Toxaway Creek	Scattered old and new growth	S-2C	"

TABLE V

National Forest & Adjacent Areas containing Ribes (No White Pine)

Place	Atlas Ref. No.	Aspect	Elev.	Moisture	Forest Type	Species
Thompson's Fork: Macon.	N-3B	N.slope	3500	Moist rocky cove	N. Hardwoods	R. cynosboti
Buck Cr.(Clay Co.)	N-2B,N-3B	" "	3500	" " "	" "	" "
Rocky Cove Macon	N-3B	" "	3500	" " "	" "	" "

Miscellaneous Observations.

In some areas, some damage, due to the white pine weevil (Pissodes strobi) was found. These areas in particular were on Stonewall, Fall and Sawmill Creeks, near Georgia Camp F-9. There was also a little damage on Tuckaluga Creek near Georgia Camp F-6. This damage was not very serious as there were only a few scattered infestations.

In and about Highlands, N. C., for a radius of about ten miles, there has been considerable damage due to an ice storm which occurred during the winter of 1932-1933. The tops of a large number of white pines have been broken off by the weight of the ice. In many cases the injured trees are being attacked by a white aphis.

The cultural foremen of Ga. F-9 have found some white pine which has been infected by a fungus which they were unable to identify. The type of canker has led the foremen to believe that the fungus is a Nectria, but they are not certain.

On the 3/8 inch to the mile map a red line has been drawn across the Forest. South of this line is the general white pine region. Commercially important areas (25% white pine) are shown on this map. Outside of these areas, white pine is found to a lesser degree in mixture. There is a fairly good distribution of seed trees and the white pine is seeding in quite well in places where there have been no forest fires. There is little white pine reproduction on areas recently burned. This is probably due to the fact that white pine, having a thin bark in youth, is easily killed by fire.

In the Bull Pen section, southeast of Highlands, N. C., where most of the forest fires seem to occur, the new growth is sparse. From all indications, the area would seed in quickly to white pine if the fires were kept out because there are a large number of old trees on the area.

Recommendations for Further Work.

It was thought that additional white pine areas occurred along the Chattooga and Tallulah Rivers. With this thought in mind, such sections along these rivers were scouted and it is felt that the drainages were satisfactorily covered. The scouted areas were however, confined to National Forest land and adjacent properties. It is possible that some of the larger private holdings, not covered in this survey, may contain 25% or more white pine. In the event that such lands are acquired in the future, some additional scouting may be necessary. These lands are largely power company reservations and it is not likely that they will become part of the National Forest at any time.

Inasmuch as the white pine areas on the forest were thoroughly covered, it is not likely that any subsequent work will be extended over a larger area than is reported in detail within this survey.

Within two years, a return visit should be made to the Laurel Branch Plantation to determine whether any Ribes plants have developed as a result of seed disseminated before the thirty-three plants were destroyed. A crew of three men could do this on one day.

Ribes have been found or reported in various localities in the western part of the Forest, but there is little or no white pine in this section. These areas might be scouted to determine the location of these Ribes areas and also to determine whether there is a possibility of white pine developing on the areas to any appreciable extent. Before white pine plantations are undertaken in the future, it would be advisable to have definite knowledge concerning the presence or absence of Ribes.

Although no Ribes have been found on the pine areas in a wild state, there are many plants in the gardens of occupied farms. Work may be done in the periodical checking of such plants for infection. This work would require approximately one man-month.

From a management viewpoint there are some areas which could be made more accessible, especially the Bull Pen and Overflow sections. These are large areas with almost no passable roads. Immediate control of fires is difficult and the white pine is in danger. It is recommended that some roads be built into these areas to facilitate protection.

Cultural work can be done on all of the white pine areas. Cleaning can be done to release the new growth. Thinning and pruning might be done where the trees are large enough and where there is sufficient white pine to make such an operation worth while. There are timber sale possibilities in some white pine areas such as, Clear Creek, Blue Valley, and Mill Creek.

Cleanings and liberation cuttings may be made on all the areas scouted as the new growth is almost universal.

Below are areas which offer good opportunities for thinning and pruning.

On these areas the second growth trees are growing close together, the crowns meet, natural pruning has started, and the forest floor is covered with a thick mat of undecayed needles. The following are areas where such practices are most advisable:

Area	Atlas Ref. No.
Skittles Creek	S-7
Glade Road	S-6A
Clear Creek	S-6A
Chestnut Mountain	S-6A

Conclusions.

1. While some Ribes were found on the Nantahala National Forest, there was no indication of the presence of the white pine blister rust (Cronartium ribicola). Since Ribes rarely occurs with or near white pine on this Forest, there is very little likelihood of the disease assuming

any serious proportions in the future, unless conditions are brought about which are conducive to the spread of Ribes to white pine areas or vice versa. There is, however, some possibility of bringing the two hosts within bridging distance through the cultivation of gooseberries and currants.

2. The eastern and southern parts of the Nantahala National Forest offer an excellent opportunity to raise white pine. For the past few years fires have been kept out as much as possible. As a result, there is a large amount of new white pine growth.

3. Any areas to be planted in white pine should be scouted for Ribes, especially those areas not covered in this survey.

Signed,

Wm. H. Warriner

Costs.

In figuring the costs, the expenses for a CCC man were considered to be $75.00 per month. This is an arbitrary figure including pay, board, shelter, clothing, medical attention, and recreation costs.

From the Equipment Rental Schedule for the Forest Service, May 15, 1933 the figure for transportation was found to be .04 per mile. This figure is for a $\frac{3}{4}$ ton Chevrolet Truck, the mode of transportation used in this work.

In figuring the costs per man-day an average of twenty working days per month was used as a basis for CCC men, and twenty-seven days per month for the Cultural Foreman. These figures were divided into the monthly salary in each case to obtain the cost per day. The figure per month for CCC man, was, as stated above, $75.00, and the monthly pay for a cultural foreman is $141.95.

Total Acreage Scouted.....	17,219
Total CCC man-days.....	128
Acres scouted Per Man-day.....	134.5

Costs per man-day.

Supervision.....	$5.26
Labor.....	3.75
Equipment.....	.93
Total Cost per Man-day.....	9.94
Cost per Acre.....	.074

Total Costs.

Supervision (82 days at $5.26 per day).....	$431.32
Labor (128 days at $3.75 per day).....	480.00
Equipment (2984 miles at .04 per mile).....	119.36
Total...	$1,030.68

List of Owners of Cultivated Ribes Plants

Name	Address	Location: Atlas No.	Location: Place	No. Plants	Species
Douglass	Highlands, N.C.	S-7	Highway 28 5 mi. N.E. of Highlands N. C.	5	R. rotundifolium
Bryson, Walster	" "	S-7	Highway 28 3 mi. N.E. of Highlands	6	" "
Keener, Maiden	" "	S-7	Flat Mtn.	8	" "
Hawkins, Hubert	" "	S-6A	Horse Cove	20	" "
Toy, W. M.	" "	S-6A	Cashiers Rd. near Glade Rd.	15	" "
McCall	" "	S-6A	Clear Creek	5	" "
Chastain, Ayler	" "	S-7	In Highlands	4	" "
Rogers, Dave	" "	S-7	" "	3	" "
Rogers, Jim Bud	" "	S-7	" "	4	" "
Harris Place	" "	S-7	" "	15	R. curvatum

White pine grows well on the Nantahala Forest. Pine stand on the main road between Franklin and Highlands, North Carolina.

Photo by Pierce, 1933

SUPPLEMENTARY REPORT

S-Disease Control
Nantahala

Franklin, N. C.
August 10, 1933

Instructions for Mr. W. H. Warriner,
Blister Rust Checker

Outlined below are some important instructions which should guide you in your blister rust control work on this forest. They are in line with what has been previously discussed with you and Mr. R. G. Pierce of the Bureau of Plant Industry.

Purpose.

The aim of blister rust control work on this forest is primarily to ascertain whether any species of Ribes is present within or near to any white pine areas on government land within the forest. This involves scouting, and should any quanity of this plant be found, eradication work must be undertaken within the white pine stand and on a strip 900 feet wide around the area concerned.

Organization.

While you are engaged on blister rust control work, you will be directly responsible to the Supervisor's office. For the present your headquarters will be N.C. #9. Men necessary for your scouting work should be arranged for with the Project Superintendent in charge of this camp.

Scouting Procedure.

Maps.

In order to systematically undertake the scouting work, it is essential that a map be prepared outlining the areas on the forest where white pine is now, or may be in the future, commercially important. A 3/8" to the mile map is satisfactory for this purpose. Since the commercially important white pine area is for the most part limited to the eastern half of the forest, a map of these areas should be prepared in collaboration with the Forest Rangers. From this map, a list of drainages to scout can be prepared each week. This map may also be used as a general progress map. An extra copy of this map showing white pine area should be prepared and turned over to the Supervisor's office for transmittal to the Washington office.

In addition to the above mentioned map, it is necessary to have some maps on a 4" to the mile scale to help in locating government boundaries and for more definitely locating any Ribes found. Detailed progress should be shown on these tracings.

These maps should be complete with legends and titles and will form a part of the final report on this work.

Specimens.

Preparatory to the work, you should scout the several reported occurrences of Ribes about the forest to obtain specimens for training the men who will assist you in scouting. A list of the places where such existence has been reported has been furnished you.

Technique of Scouting.

You have been instructed in the technique of scouting by Mr. R. G. Pierce. This work should be confined to white pine areas, and you are most apt to find these bushes growing on ridges, along water courses or on talus slopes.

It is not expected that you will use more than three CCC men on your scouting work. It will be preferable to use local men from the section of the forest in which you are working if you can obtain such men from the project superintendent. It is planned, I believe, to use two-man crews. At least once during each week you should work in turns with each of the men on your second crew to be sure they are looking in the proper places. It would be well at least every 10 days to make a check of some likely area the second crew has covered to satisfy yourself that they are functioning properly.

Should any Ribes be found, within 900 feet of a stand in which white pine comprises 25% or more of the total stems, it should be pulled up by the scouting crew unless it covers more area than this crew can handle and apparently warrants a special eradication crew. In this latter case the location and extent of this occurrence should be shown on a tracing of a 4" to the mile map of the area, and a special report should be made to the Supervisor recommending eradication work and setting forth details for undertaking this job such as size of crew, transportation, crew organization, estimated length of job, and any other pertinent details surrounding the work. In short, a definite complete plan of crew eradication must be prepared by you and approved in the headquarters office before the work is undertaken.

Records.

You should keep a complete and detailed diary of your work each day.

In addition, the following data should be carefully recorded from which to make the final report on the scouting work:

1. Areas scouted by dates.
2. Occurrence of white pine in commercial quantities as previously defined should be shown on 4" to the mile tracings in detail.
3. Areas scouted should be shown on this same map in detail.
4. Occurrence of individual Ribes bushes or groups of bushes should be shown on 4" to the mile maps together with approximate elevation and proximity to white pine.

5. The number of bushes found at each place should be noted as well as the species and whether the bushes were pulled.

6. The system of scouting each area should be noted together with names of men doing scouting.

7. A general description of the country scouted should be noted.

8. Any other facts of interest in the white pine areas or pertinent to the existence of Ribes should be noted.

General.

As indicated in the paragraph headed Purpose, the objective of this work is to make a systematic determination of the occurrence of Ribes near commercially important white pine areas. This naturally necessitates the preparation of a detailed map of the occurrence of white pine in commercial quantities which will be of considerable administrative value. Necessarily, this work is left largely to your own initiative.

Because this forest lies towards the southern limits of range of the northern species of Ribes, and towards the upper limits of the range for the southern species, this work is apt to become monotonous and mechanical with repeated lack of success in finding this shrub. You must guard against this development in your men and in yourself. Both you and your men must maintain an open mind as to the existence of this plant and realize that negative results are valuable as well as positive findings, provided the work is carried on in a thorough and painstaking manner. This office is behind you in this undertaking. Feel free to discuss your problems with the men here at anytime. We are looking for a report which can be depended upon in timber management on this forest in the future.

(Signed) J. B. Byrne
Forest Supervisor.

Data on Acreage of White Pine and Stand.

Mr. J. B. Byrne, Forest Supervisor in letter of December 15, 1932 to R. G. Pierce writes:

"On the Nantahala Forest there is very little area worth 5% of merchantable white pine. We do have, however, a considerable acreage of cut over second growth land in which white pine makes up 5% or more of this stand. The acreage estimated in the various States which maintain this type of stand areas follows:

South Carolina..... 2000 acres.
Georgia..... 8000 acres.
North Carolina..... 30000 acres."

In a report to the District Office in Washington the supervisor furnished the following data as of January 1, 1930 for the different units of his forest.

South Carolina..... 5,890 M feet B. M. of sawtimber
Georgia ..... 3,576 " " " " " "
North Carolina.... 1,009 " " " " " "

Data on Ribes.

Concerning Ribes in the Forest, Supervisor Byrne wrote on December 31, 1932: "As far as we know there is no native Ribes within the Nantahala Forest."

Additional Data on Ribes within Nantahala National Forest or close to it.

A. Ribes cynosbati at Lower Falls of the Cullasaja River reported by Paul V. Siggers in 1917.

B. Ribes cynosbati on the Big Santeetlah reported by Robert M. Beeman August 9, 1933, blister rust checker on the Cherokee National Forest. He writes: "I noted the following in the Nantahala: At the head of the Big Santeetlah Creek among the boulders in the stream as it tumbled down the mountainside, are occasional specimens of R. cynosbati. None were seen lower than 3,300 feet. White pine begins about 8 miles up from where it enters the Lake. No Ribes were noted near the white pine, however, there may be some."

Areas Worked on the Nantahala Forest in 1933

South Carolina:

Private land adjoining Forest	463 acres.
National Forest land	425 acres
Total	888

Georgia:

Private land adjoining Forest	739 acres.
National Forest land	6392 acres.
Total	7131

North Carolina:

All lands surveyed	9200 acres.

Grand total acreage worked..... 17,219

Typed/ms
4/17/34

GREAT SMOKY MOUNTAINS NATIONAL PARK

Foreword:

Before 1933 it was considered that there were practically no places in the Park where the white pine ran 5 per cent or better of the stand, but there had been up to this time no intensive surveys carried on for white pine.

Personnel:

The Superintendent of the Park, Mr. J. Ross Eakin directed the work and secured the cooperation of the Camp Superintendents. In the summer of 1933 the presence of the ECW camps throughout the Park area made possible the employment of a blister rust checker and assistants to carry on a Ribes pine survey. Mr. Joe Frank Manley was chosen to take charge of the scouting on account of his forestry training and his previous experience in blister rust control work in north Idaho.

Mr. Manley writes of the pine and Ribes as follows:

White Pine

Cataloochee Creek

The basin of Catalooche Creek and its tributaries constitutes the thickest and most important stand of white pine seen up to date (August, 1933). Over the divide from Waynesville in to Catalooche basin white pine is growing well up to 4,000 feet elevation. Present stands of Strobus over this region up to 65 years of age are growing from 3 per cent per acre to stands of 60 per cent per acre and on one open hillside Mr. R. G. Pierce and I checked an area of young reproduction 50 feet square, that contained 264 seedlings from 1 to 4 years of age. (This is an average of 4600 trees per acre, a heavy stand even at 4 years). There are numerous open sites of 3 to 6

acres that are in heavy reproduction, which with adequate protection are certain to reach maturity in pure stands.

Three miles north of Mt. Sterling divide, white pine comes in along the park boundary in isolated groups and continues along boundary up to 2800 or 3000 feet up the divide between Mt. Sterling, North Carolina and Newport, Tennessee. In the Mt. Sterling area white pine occurs in 1 per cent to 3 per cent stands up Chestnut Branch. This area is small but is well adapted to white pine growth as the widely scattered stands show.

Hazel Creek

For the greater part of Hazel Creek the best stands of pine are outside the park boundary but they may eventually be taken in. The pine area within the park on Hazel Creek was found to be Ribes-free.

Big Creek

An area of 10 acres of white pine was found on this watershed.

Deep Creek

At a distance of 6 miles up Deep Creek from Tuckaseegee River white pine comes in and extends in dense stands along the low lands of Deep Creek for approximately 5 miles. Its range covers approximately 400 acres with nearly 50 acres of 60 to 75 per cent stands. This pine is the result of heavy seeding from numerous older trees of this region. The average age is 12 to 15 years.

Other Areas

There are isolated spots of white pine occurring over the park that may become of importance in a number of years (perhaps 25 or 30 years hence) but which are of no importance at present for map notation. These

however, were scouted and are Ribes free. Not only were the three areas listed above scouted but also Forney Creek, Eagle Creek and Twenty Mile Creek. The white pine was either absent or very scattered in these latter areas.

Ribes

Cataloochee Area

R. grossularia were found growing along a garden fence at Cataloochee Ranch.

The discovery of R. cynosbati growing on Cataloochee Creek at 2600 ft. elevation made the parallel strip method of eradication necessary over approximately 3 acres on the east side of the creek $\frac{1}{2}$ mile above Palmer's Ranch. Of 800 acres inspected in the Cataloochee area in August, 1933, 5 cultivated Ribes and 126 wild Ribes were destroyed. All of the cynosbati were found growing along the creek in wet rocky soil with north-west exposure, under 50 to 75 per cent shade and were heavily fruiting. Twenty-six hundred feet is the lowest elevation I have found wild Ribes growing at any place in the Park.

From Cataloochee to Mt. Sterling a distance of 15 miles R. Cynosbati occurs $\frac{1}{2}$ mile from top of divide (north) in a wet rocky cove 40 feet off left side of road in shade of 40 to 50 %, and again occurs 1 mile north of divide in wet rocky cove 60 ft. off left side of road under 60% shade. Three miles north from the divide white pine comes in.

On Baxter Creek 3 miles southwest of Mt. Sterling, N. C. and 3/4 miles up from Big Creek to the left, Ribes Cynosbati occurs abundantly in the wet rocky north exposure under 70 to 80% shade at not more than 3000 feet elevation. And again on Mouse Creek at approximately the same elevation, under 80% shade in wet, rocky north exposure. These are far out of infection

distance of any white pine but below pine elevation, which are the lowest found by the writer up to date, July 30th., 1933.

The Baxter Creek Ribes may be from 100 to 200 ft. lower than 3,000 ft. (July Report, J.F. Manley)

Forney Creek

R. Cynosbati occurs at 3,500 ft. upward toward crest of divide, in characteristic rocky wet coves, (not more than 20 white pines seen in entire watershed).

Summary

R. cynosbati and R. rotundifolium were the only 2 wild species found and in no instance were rotundifolium located below 4,800 feet with R. cynosbati being found on one site at 2,600 ft. and generally from 4,000 ft. upward.

R. rotundifolium occurs abundantly on the higher peaks along the crest of the state divide in dry rocky soil with plenty of sunlight and this season (1933) were particularly heavy fruited and I have noticed a bird, the flicker (golden winged woodpecker probably) that seems to be fond of the fruit; which may be responsible for some of the cultivated Ribes escaping cultivation.

R. cynosbati is less confined to a given elevation than is R. rotundifolium. From this I deduce that R. cynosbati and cultivated species constitute the greatest menace to the pine in the Great Smoky Mts. National Park. The places where R. cynosbati are most likely to be found are deep wet rocky coves with shade from 50 to 90%, and abundantly from 3,500 feet upward.

Number Ribes destroyed in Park in 1933

North Carolina	126 wild	7 cultivated bushes	
Tennessee		16 " "	
Total both States	126 "	23 " "	
			Total 149

Area covered

North Carolina	2,010 acres
Tennessee	1,825 "
Total	3,835 "

Number of C.C. Man Days used in scouting

North Carolina	12
Tennessee	35
Total	47

Cost

Checker, July 1 to September 30 $402.98

	N. C.	Tenn.
Estimates	$188.83	$165.15
Labor	12.00	35.00
Transportation	--	2.00
Total excl. overhead	200.83	202.15

The above data is taken from the attached statistical report of Mr. Manleys./ In his annual report the number of man days labor in North Carolina is given at 15 rather than 12.

Method of Scouting

The blister rust checker headquartered at one C.C. camp, and then the next adjoining. From one to three men were secured at each camp to assist the checker in the survey. Since white pine is usually located in the valleys and up the smaller creeks, these were scouted intensively. Other areas however were gone over extensively. When there was no camp in the vicinity of a watershed, Mr. Manley scouted the area alone and on foot, making trips of many miles in a day. Records were available showing the location of former home sites. These were used to check up on the presence of cultivated gooseberries and currants. Mr. Manley writes (Sept. 23) "There is no unscouted pine area near a C.C.C. camp."

Educational Work.

Mr. Manley contacted each of the Camp Superintendents and enlisted their cooperation, and that of their men in keeping a lookout for both wild and cultivated Ribes. Specimens of Ribes were taken to the Camps and left there together with blister rust circulars so that men in each camp became acquainted with the several Ribes species, but also the menace of the blister rust.

Mr. Manley writes (Sept. 30) "Most of the Camp Superintendents and natives were not familiar with blister rust work and the menace of Ribes at the beginning, but I feel sure that if these men should happen to run across any Ribes at any time they will remember my instructions to eradicate them."

GREAT SMOKY NATIONAL PARK

STATISTICAL REPORT OF BLISTER RUST CONTROL WORK UNDER E.C.W.

State Tenn. & N. C. Year 1933

| | | |

SUMMARY OF ALL ERADICATION WORK

in

NORTH CAROLINA DURING 1933

	National Forests	National Parks	Total Federal	Private
Acreage Worked	27,560	2,010	29,570	0
Number of Ribes Pulled	227	133	360	0
Man Days Supervision & Labor	376	39	415	0
Cost of Control Work	$1,627.65	$200.83	$1,828.48	0
Total Acreage of White Pine Protected	-	-	16,886	-
Acres Worked per Labor Man Day	-	-	99.2	-
Acres Worked per Total Man Day	-	-	71.2	-
Number of Ribes per Acre	-	-	0.012	-
Cost of Eradication per Acre	-	-	0.062	-

SOUTH CAROLINA

Policy:

In 1933 the Federal Government had no cooperative agreement with South Carolina officials, hence no work was carried on in the State on private lands, except in connection with the scouting on private lands. It is the policy of the government to secure such an agreement in the spring of 1934. Work in 1933 was begun on the Nantahala National Forest.

White Pine:

Native white pine in commercial quantities is confined to the mountainous section of the counties of Oconee, Pickens, Greenville and Spartanburg. It is estimated there is about 4,075 acres of woodland in these counties having 5 per cent or more of white pine. Approximately 2,000 acres are within the Nantahala National Forest. It was estimated by the Forest Supervisor that there were 5,890,000 feet B.M. of saw timber in the South Carolina unit of this Forest January 1,1930. Nothing is known of the extent of white pine planting in the State. White pine is now being handled by the State Forest Tree Nursery at Camden on a small scale, 2,100 white pines being distributed in the calendar year 1932 by the State Forester. No private nurseries are known to be handling white pine.

Ribes:

There is no data available on the presence of wild or cultivated Ribes within the State. It is known that gooseberries of wild and cultivated species are being grown in the mountainous section of North Carolina at Highlands and at other points close to the South Carolina line,and it is likely that they are being grown in similar sections of South Carolina.

Blister Rust:

No blister rust of white pine has been found in South Carolina.

Nursery Sanitation:

No work of this character has been carried on, nor is such work contemplated at the present.

Black Currant Eradication:

There is no data available concerning a single planting of this species (*R. nigrum*) in the State.

Control Work on National Forest

Personnel:

Mr. W. H. Warriner, former blister rust man, was designated by the Supervisor of the Nantahala National Forest to take charge of the work on the Forest in North Carolina, Georgia and South Carolina.

SOUTH CAROLINA (Continued)

Plan of Work:

The blister rust checker trained men to recognize Ribes at each camp and with them carried out a reconnaissance. In the South Carolina unit, 4 men including the checker, scouted on September 13, 15 and 29, and 2 men including checker on October 12 and 13. The first work was carried on from the C.C.C. camps F-9 at Franklin, North Carolina; while later, work was carried on from Camp F-1 at Mountain Rest, South Carolina. Twelve man-hours of labor were expended in scouting 463 acres of private land, and 49 man-hours in scouting 425 acres of federal lands. The checker spent 4 hours in supervising the work.

Results Accomplished:

A total of 425 acres of federal land, and of 463 acres of private land adjoining the Forest, were scouted, making a total of 888 acres covered in the State . No Ribes either wild or cultivated were found.

Costs:

Labor - 11 days at $1.00 per day	$11.00
Transportation of men	11.04
Supervision	21.00
Total	$43.04

Future Work in the State:

It is planned to carry on blister rust control reconnaissance in South Carolina, using one agent and laborers as needed, as soon after April 1,1934, as possible. This work will be primarily on non-federal lands. The State leader will coordinate this work with work which has been and will be done on the National Forest.

* ESTIMATED COST

Private Land	$23.04
Government Land ...	20.00
T O T A L ---------	$43.04

State South Carolina — Year —

Name of town where camp located and F.S. camp number				Franklin, NC Camp F-9	Mt. Rest, S.C. Camp F-1					Totals for State
No. towns where erad. performed				1	1					
Period work performed				9/13-15/29	10/12-13					
Ave. No. enlisted men per day				3	1					
No. tech. foremen and checkers				1	1					
Results of Ribes Eradication Work*	Private Lands	Initial Erad.	Acreage erad.	463						463
			Ribes pulled: Wild	-						-
			Ribes pulled: Cult.	-						-
			Man hours enlisted personnel: Erad. Ribes	-						-
			Man hours enlisted personnel: Total time	12						12
		Re-Erad.	Acreage erad.							
			Ribes pulled: Wild							
			Ribes pulled: Cult.							
			Man hours enlisted personnel: Erad. Ribes							
			Man hours enlisted personnel: Total time							
	Public Lands	Initial Erad.	Acreage erad.	290	135					425
			Ribes pulled: Wild	-						-
			Ribes pulled: Cult.	-						-
			Man hours enlisted personnel: Erad. Ribes	-						-
			Man hours enlisted personnel: Total time	9	10					19
		Re-Erad.	Acreage erad.							
			Ribes pulled: Wild							
			Ribes pulled: Cult.							
			Man hours enlisted personnel: Erad. Ribes							
			Man hours enlisted personnel: Total time							
	Totals (Initial and Re-erad.)		Acreage erad.	753	135					888
			Ribes pulled: Wild	-						-
			Ribes pulled: Cult.	-						-
			Man hours enlisted personnel: Erad. Ribes	-						-
			Man hours enlisted personnel: Total time	21	10					31
Cost of crew transportation				$6.88	$4.16					$11.04
Technical Foremen and Checkers	Individual Scouting for Ribes		Acreage erad.							
			Ribes pulled							
	8 Hour Man Days On		Ribes scouting							4
			Crew work	2	2					
			Supervision							
	Wage Cost		Ribes scouting							$21.00
			Crew work	$10.50	$10.50					
			Supervision							
Expenses										

*Under the sub-headings "Acreage eradicated" and "Ribes pulled" include both the work done by the enlisted personnel and the Ribes scouting performed by the technical foremen and checkers. However, under "Man hours" record only the time of the enlisted personnel.

NANTAHALA NATIONAL FOREST

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SUMMARY OF ERADICATION WORK IN SOUTH CAROLINA IN 1933

	National Forests	Private Lands	Total all lands
Acreage worked	425	463	888
Number of Ribes pulled	0	0	0
Man-days supervision & labor	10	11	21
Cost of control work prorated	20.00	23.04	43.04

Total acreage of white pine protected	888
Acres worked per man-day labor plus supervision	80.7

T E N N E S S E E

Policy

In 1933 the Federal government had no cooperative agreement with Tennessee officials. No work was therefore carried on on private lands. It is the policy of the government to secure such an agreement in the spring of 1934. In 1933 through cooperation with the U.S. Forest Service and the National Park Service, blister rust control reconnaissance and eradication were carried out on the Unaka, Pisgah and Cherokee National Forests and in the Great Smoky Mountains National Park.

White Pine

A. Distribution and Acreage

Native white pine in commercial quantities is confined to 18 counties in the mountainous section of eastern Tennessee and the Cumberlands. Estimates of the area bearing 5% or better of white pine vary from 107,000 acres by Cope to 236,000 acres by the U.S. Forest Service. Of this latter figure, the Forest Service estimates that 85,441 acres are in National Forests. At least 2,010 acres of white pine land are in the Great Smoky National Park. This leaves 148,549 acres in private ownership. The largest acreage of white pine occurs in the counties of Johnson, Carter, Unicoi, Green, Polk, Fentress, Scott, Morgan, Cumberland, Rhea and Washington. There are unknown quantities in Sullivan, Cocke, Sevier, Blount, Monroe, Hamilton and Bledsoe Counties and probably some in Anderson and Hamilton Counties. Up to 1932 inclusive only 20,200 white pines had been distributed from State nurseries for planting. (The U.S. Forest Service, however, planted 75.5 acres of white pine from 1909 to 1931 inclusive). White pine occurs scatteringly as ornamental trees either singly or in groups in many places in the eastern part of the State.

B. Lumber Production in Tennessee

The following statistics are taken from bulletins and reports of the U.S. Department of Commerce:

1927 - 4,302,000 Ft. B.M.
1928 - 4,746,000 " "
1929 - 7,138,000 " "
1930 - 5,112,000 " "
1932 - 1,092,000 " "

The 1932 lumber cut was valued at the mill at $20,02 per M ft. or at $21,862.00.

C. Stand

The Forest Service in January 1932 estimated that there were 114,000,000 feet of white pine saw timber in the State. This is worth at

$6.86 per M (the average annual stumpage price for the period 1923-30 according to R.E. Marsh of U.S.F.S.) $782,040.00. In addition, the Forest Service estimated that there were 66,000 cords of white pine on cordwood areas which at $1.75 per cord would be worth $115,500.00., The cordwood converted into feet B.M. would be equivalent to 33,000,000. The combined value of merchantable white pine timber and cordwood on cordwood areas is estimated at $897,540.00 and the stumpage at 147,000,000 ft. B.M.

D. Nurseries

The following is a partial list of nurseries growing white pines in the State.

State Forest Nursery	Trees for forest purposes.
Howell Nursery, Knoxville	For ornamental purposes.
Sweetwater Valley Nursery, Sweetwater	" " "

Ribes

Ribes are found scattered in the higher mountains along the Tennessee-North Carolina line, occasionally extending down into the white pine zone. Here the wild Ribes have not been found below 2,000 feet elevation except at McFarland on the Hiawassee River where the elevation is about 1,000 feet. In the Cumberlands wild Ribes are reported rare or absent. In the mountains Ribes cynosbati and rotundifolium are the most abundant species, followed by R. glandulosum, R. missouriensis has also been reported in the State, but it occurs probably in lower lands, particularly in the western part of the state. Wild Ribes, particularly R. rotundifolium, are frequently brought down to the little mountain farms from higher up on the ridges. Occasionally the cultivated gooseberry is also found at abandoned homes in the white pine belt as in Cades Cave in the Great Smoky Mountains, National Park.

Blister Rust

The white pine blister rust has not been found in Tennessee.

Nursery Sanitation

No work has yet been carried out by the Division of Blister Rust Control.

Black Currant Eradication

There is no data available on the planting of black currants in the State. It is not believed they are very numerous, for except in the mountain regions the cultivated Ribes do not thrive, and so far no Ribes nigrum have been found planted in the mountains.

WHITE PINE BLISTER RUST CONTROL

Situation on Cherokee National Forest. on September 9, 1933.

Blister rust has not been found on this Forest. According to latest reports its southern limit is 150 miles north of the North Carolina-Virginia line. The C.C.C. program provides the opportunity to safeguard the Forest at this time.

From July 25th to the present date Cultural Foreman, Robert M. Beeman, designated as Blister Rust Checker, has been working on this project, under the supervision of Associate Pathologist, Roy G. Pierce of the Division of Blister Rust Control. The checker visited the twelve C.C.C. camps on the Forest, leaving samples of Ribes and enlisting the cooperation of cultural and truck-trail foremen, through their respective project superintendents, in looking for said Ribes while on the job. That done, likely Ribes sites throughout the Forest were scouted via road, trail and brush. Whenever a sizeable patch was found within working distance of a C.C.C. camp, men from that camp were employed in scouting and eradication in the designated area.

It is believed probable that all Ribes within striking distance of white pine on national forest land has been located. A few instances of cultivated Ribes on private land within the acquisition boundaries are known; there are undoubtedly others. It is recommended that as farm lands are acquired the garden plots be cleared of any currant and gooseberry bushes which may be therein.

Ribes was found in three different localities. By far the largest and most heavily infested of these is the upper Tellico basin; so far a crew of 4-5 men have pulled up bushes for 13 days there, and it is doubtful

that the work in that watershed will be finished this fall. Only a small part of the white pine on the middle Tellico has been conclusively protected; the North River, which contains considerable young white pine, hasn't been touched; Bald River hasn't been scouted much, but is reported to contain very little white pine. Ribes rotundifolium was positively identified only once--on State Line Ridge, at elevation of over 4000 feet, near Fain's place. The major portion of the Ribes in this basin is R. cynosbati; its habitat is rock bars on steep headwaters, at elevations of 2000 to 5000 feet. Two patches of white pine were located--through local questioning--on the high ridges, and protected. Most of the white pine is in the valleys and on the lower slopes; adopting a distance of 900 feet between pine and Ribes as safe, much of the Ribes can be left--but there is some to be eradicated in a considerable proportion of the coves.

Another locality is Big Frog Mtn.---on which a crew of four men scouted and eradicated eight days, cleaning it up. There are a few white pine on the mtn. within striking distance of the Ribes areas.

The third site is on the Hiwassee river, two miles upstream from McFarland; from this the checker pulled the Ribes in one day. Three days' scouting in the vicinity failed to uncover any more bushes.

Location of white pine as shown on the map is by no means accurate; it is so placed in accordance with personal observation and cursory information received from the rangers; it is believed to be decidedly conservative. In general, distribution and density increase from north to south, and from high drainages to low, wide valleys. The Georgia district contains the greater portion of the white pine on the Forest. It is continually evident that the light-seeded white pine is taking advantage

of the opportunity present in burned and logged areas and abandoned fields to increase its distribution.

Recommendations:

1. Cultural Foreman Beeman be transferred to C.C.C. Camp F-9, continue eradication this fall, finish next spring if necessary.

2. As farm lands are acquired, any currant or gooseberry bushes in garden tracts be pulled up.

3. When the Citico Creek drainage is acquired, measures similar to those described in this report be adopted.

4. In five to ten years, areas now eradicated be examined.

STATISTICAL REPORT OF BLISTER RUST CONTROL WORK UNDER E.C.W.

Cherokee N. F.

State: TENNESSEE			Monroe County	Polk County	Polk County		YEAR 1933
Name of town where camp located and F. S. camp number			Citico Tenn. F-9	Tumbling Cr. Tenn. F-10	McFarland Tenn.	STATE	TOTALS for STATE
No. counties where erad. performed			1	1	1	-	3
Period work performed			8/9 - 9/19	8/28 - 9/6	8/20 - 8/23	-	-
Ave. No. enlisted men per day			8	4	-	-	-
No. tech. foremen and checkers			1	1	1	-	1
Initial Erad.	Acreage erad.		214	30	5	-	249
	Ribes Pulled	Wild	61,800	810	220	-	62,830
		Cult.	-	-	-	-	-
* Man hrs. enlisted personnel	Erad. Ribes		600	48	-	-	648
	TOTAL TIME		790	130	-	-	920
No Reeradicative Work			-	-	-	-	-
Cost of Crew Transportation			-	-	-	$5.40	-
Cost of Checkers' "			-	-	-	66.30	-
TOTAL COST FOR TENNESSEE			-	-	-	-	$71.70
Technical Foremen and Checkers	Individual Scouting for Ribes	Acreage erad.	-	-	5	-	5
		Ribes pulled	-	-	220	-	220
	8 hour Man Days On	Ribes scouting	9	2	4	-	15
		Supervision	1	1/4	-	-	1¼
		Crew work	14	1	-	-	15
	Wage Cost	Ribes scouting	42.30	9.40	18.80	-	70.50
		Supervision	4.70	1.20	-	-	5.90
		Crew Work	65.80	4.70	-	-	70.50
	EXPENSES **		45.60	6.20	7.60	-	59.40

* Under the sub-headings "Acreage eradicated" and "Ribes pulled" include both the work done by the enlisted personnel and the Ribes scouting performed by the technical foremen and checkers. However, under "Manhours" record only the time of the enlisted personnel is shown.

** Includes only per diem while at stipulated camps. Does not include per diem while elsewhere on Forest, or cost of operating checker's Government car.

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COST DATA ON CHEROKEE NATIONAL FOREST

For blister rust control work
in 1933.

Cost of Supervision

	Total for period	
Salary - 1-5/6 mo. & $142.00 ----------	$260.30	
Expenses - - - - - - - - - - - - - - - -	75.30	
Transportation 2210 miles at 3 cents --	66.30	
Total ----------		$401.90
Packing- for Spike Camp -- - - - - - - - - - - - - - - - - - -		4.00
Crew transportation 180 miles at 3 cents per mile - - - - - --		5.40
Cost of labor - 184 man days at $1.00 - - - - - - - - - - - -		184.00
Total cost - - - - - - - - - - -		$594.30

(The above is calculated on the same basis as for other forests in this district.

Mr. Beeman has calculated costs on another basis, presented below:-

Supervision same as above --- - - - - - - - - - - - - -	$401.90
Labor wages 184 at $1.50, thus charging for the 10 days per month not worked but for which they were paid - - - - - - - - - - - - - - - - - - -	276.00
Grub and camp expenses of enrolled men, 184 man days at $1.50 -	276.00
Crew transportation - - - - - - - - - - - - - - - - - -	5.40
Spike camp - packing - - - - - - - - - - - - - - - - - -	4.00
	$963.30

Data compiled by Roy G. Pierce.

TENNESSEE

COST DATA FOR CHEROKEE FOREST SEPARATED ACCORDING TO STATES

Mr. Beeman reports five days of supervision in Georgia by himself in 1933. At $147.00 per month, the cost would be $23.66

Subtracting this from total cost for forest $594.30

would leave for Tennessee costs $570.64

CHEROKEE NATIONAL FOREST

Cost of Blister Rust Control Work, 1933.

Salary of checker - 1-5/6 x $142 - - - - - - - - - - -	$260.30	
Per diem expenses of checker - - - - - - - - - - - - -	75.30	
Checker's car - 2210 miles at 3 cents per mile - - -	66.30)	71.70
Crew transportation - 180 miles at 3 cents per - - -	5.40)	
Spike camp - packing - - - - - - - - - - - - - - - - -	4.00	
Wages of enlisted men $30 per month 20 working days per month 30/20 equals $1.50 184 man days at $1.50 - - - - - - - - - - - - -	276.00	
Grub and camp expenses of enlisted men 184 ~~day~~ days at $1.50 - - - - - - - - - - - - -	276.00	
Total - - - - - - - - - - - - -	$963.30	

(Sgd) R. M. BEEMAN

BLISTER RUST CONTROL ON THE UNAKA NATIONAL FOREST IN TENNESSEE

Mr. Ward H. Robens, Cultural Foreman on the Unaka National Forest was detailed on July 17, 1933 by Forest Supervisor C.L. Graham to act as blister rust checker on the Forest and to be in charge of all work of scouting and Ribes eradication to be carried on. During the early part of the season from July 17 to September 27, the work was carried on in Virginia; from September 28 to October 6 it was carried on in Tennessee. All of the tennessee work was conducted in Johnson County, Tennessee from Camp F-7-Va. near Damascas, Va.

A brief summary of the work in Tennessee is given in the accompanying tables. For details on method of work, areas covered, etc., see under Virginia - Unaka Forest on pages 92 to 105.

TENNESSEE

Blister Rust Control in Calendar Year 1933.
(Extracts from R.G. Pierce's report for Southern Appalachian District, 1933)

White Pine Stand - Unaka Forest in Tennessee. "The U.S. Forest Service data as of January 1, 1931 shows a stand of saw timber in the Unaka Forest in Tennessee of 11,443,000 ft. b.m. No data on acreage is available."

Scouting and eradication on Unaka Forest in 1933

Name of town	Damascus, Va. camp
Camp from which work was carried on	work carried on in Tenn.
Period work performed	September 28 - October 6.
Acreage of white pines**	375
" covered by checker	54
" " " scouts	1,066
" " " " per 8 hr. man day	66.6
Total acreage worked	1120
Ribes) Wild	0
pulled) Cultivated	2
Man hours) Eradicating Ribes	83.7
enrolled) Total time*-	128
personnel)	
Wages of scouts	$24.00
Wages of supervisor	42.57
Combined cost of scouts and supervisor ***	66.57
Cost per acre scouted (pine area plus protection zone)	$0.059
Cost per acre of white pine scouted	0.177

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*Calculated on basis of 8 hours equals one man day.
**This includes only the areas where white pine occupies 5% or more of stand.
***Transportation not included since men rode to work with timber stand improvement crews.

SUMMARY OF AREAS WORKED IN UNAKA FOREST IN TENNESSEE IN 1933.
(All areas were in Johnson County)

Name of area or location	Unit No.	Pine area	Area in acres		White pine		Approximate elevation in feet
			W. pine plus protection zone	White pine only	No. per acre	Age in years	
Sugar camp branch	64	1	85	35	100-200	10-60	2500-3000
McQueens Knob Branch	23	1	530	150	200-300	5-70	2800-3200
Old Road Branch	28	1	300	150	300-400	1-50	2700-3000
Marshall Slide Branch	24	1	205	40	200-300	5-70	2800-3200
Total		4	1120	375			

No Ribes were found in these four areas. The two cultivated gooseberry bushes destroyed were found at some distance from these areas. They were near pine on private land.

TENNESSEE

Pisgah National Forest

Mr. P.A. Swarthout, Blister Rust Checker on the Pisgah National Forest has written a full report covering both North Carolina and Tennessee, extracts of which are found in his report on this forest found on pages 22 to 28 inclusive, under North Carolina. Work in Tennessee was carried on by Mr. Swarthout on the French Broad Division, working out of Cove Creek CCC camp.

Total acreage white pine protected in Tennessee - - - - - -	1522
Total area covered including protective zone - - - - - - - -	3315
Number Ribes bushes found - - - - - - - - - - - - - - - - -	26
" " " destroyed - - - - - - - - - - - - - - - -	26
Man hours required (7 hrs = 1 day) - - - - - - - - - - - - - -	238
Man hours supervision -	91
Cost labor at $1 per day - - - - - - - - - - - - - - - - - -	-$34.00
Supervision (Mr. Swarthout) - - - - - - - - - - - - - - - - -	- 71.50
Total cost - - - - - - - - - - - - - -	-105.50

For statistical sheet report of

work done on Great Smoky see -

PAGE 7 - North Carolina

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PLANT INDUSTRY

WASHINGTON

DIVISION OF
BLISTER RUST CONTROL

GREAT SMOKY MOUNTAINS NATIONAL PARK

Foreword

Up to 1933 no intensive survey had been carried on in the Park area for pine or Ribes. However, extensive scouting had been carried on previous to the setting aside of the Park area, by Prof. Alban Stewart in 1917 in the Tennessee part of the Park.

Personnel

Mr. J. Ross Eakin, Superintendent of the Park cooperated with us and approved the appointment of Mr. Joe Frank Manley to carry on the survey. The work started June 28. Mr. Manley writes of the pine and Ribes conditions as follows:

White Pine

Cades Cove

Cades Cove is one of the important white pine regions of the park. The fertile Alluvial soil and long slopes of this area are particularly favorable to young growth that is coming in over an area extending from Laurel Gap West for approximately eight miles and up the North and South slopes to an elevation of 2500 feet. However the white pine is not continuous over the entire area, there being large farms in the valley that have interrupted reproduction from the larger seed trees that occur along the stream banks, sufficient to insure heavy reproduction if allowed to come in.

On the slopes, up to 2500 feet and over Laurel Gap Eastward white pine occurs in stands of 1 to 5 % per acre along Laurel Creek to the junction with Middle Prong of Little River. With heavier growth occurring along stream banks and in the coves.

The dead line for white pine growth up the slopes is 2500 feet; not more than half a dozen trees being seen above this elevation. There is no visible reason for this condition since exposure and soil type favor growth up to at least 3000 feet. In other park areas, particularly Cataloochee, white pine is growing at a height of 4000 feet. There is a possibility that as time goes on, Cades Cove white pine will go with it up to 3000 feet at least.

Sugarland Mountain Locality

The only white pine seen in this region were a few isolated trees occurring around Gatlinburg. Sugarland is not a white pine area and reproduction from the widely separated trees along the Little Pigeon River could scarcely be considered at present. No more than a dozen white pine were seen over an entire area extending from Gatlinburg, Tenn. along the road to New Found Gap and an area extending in width from Mill Creek, west to the ridges of Sugarland Mountain.

Green Brier Locality

Part of this area was worked out from Sugarland and the only white pine seen occurs intermittently along the boundary from Gatlinburg to where the road turns up to Green Brier. There is not enough of this to be of any importance as only a very few isolated trees occur inside the park boundary.

In addition to the above three areas other watersheds scouted in Tennessee included Abrams Creek, Laurel Creek, West Prong and Middle Prong of Little River, and West Prong and Middle Prong of Little Pigeon River and Cosby Creek. Abrams Creek contained some white pine.

Ribes

Cades Cove

There is little chance of blister rust breaking out in this region. As a result of close scrutiny and thorough search around all homes and abandoned home sites, four bunches of cultivated Ribes were located and uprooted. The first to be discovered were growing on the old Rose abandoned home site ½ mile west of Laurel Gap on Anthony Creek.

Next to be located were at David Sparks home in upper north east end of Cades Cove, 2 and one tenth miles west of Laurel Gap. The next discovery was made at the old Ledbetter abandoned home site in the upper west end of White Oak Sink 1 mile northwest of C.C.C. #1, just over Scott Mountain in second cove from top of mountain on east exposure.

On Laurel Creek ¼ mile north west of C.C.C. #1, at the Seatin abandoned home site in Spruce Flats the fourth and last bunch of domestic Ribes were found growing along rail fence in dry soil with white pine in close proximity. This plant like those previously mentioned had only one root system and showed no evidence of escaped cultivation. All were eradicated and scouting continued until the writer saw there were no more domestic Ribes in this locality.

From this point attention was turned to wild Ribes which demanded concentration on the slopes, coves and ridges from valley floor to summits. As scouting continued upward, Ribes Rotundifolium were found to be growing from a height of 5000 feet upward on Thunder Head ridge along the rocky north exposure in shallow arid soil. These Ribes, being out of white pine range and far beyond infection distance, are important only from the standpoint of their abundant growth, which continues along the crest of State divide from

5000 upward. Specific places of occurrence will be shown on permanent map now being plotted.

Sugarland Mountain Locality

After intensive scouting for domestic Ribes without any finds, work shifted to the ridges and peaks where Ribes rotundifolium were seen on Bull Head at 4800 feet, rocky north exposure.

Ribes rotundifolium and Ribes cynosbati are present in this area at high elevations. Ribes cynosbati occurs on Mill Creek at 4000 feet upward in the wet rocky coves under shade of 50 to 75 per cent.

Green Brier Locality

One bunch of cultivated Ribes were found growing $\frac{1}{4}$ mile inside the boundary on Green Brier road to C.C.C. camp at abandoned home site. There was no evidence of escaped cultivation and apparently had the whole region to itself, no others could be found.

Ribes cynosbati is present on Roaring Fork at 4000 feet and Rotundifolium occurs on Mt. Leconte at 5500. This is far removed from any white pine...thus no danger.

Number Ribes destroyed

Cades Cove	5 cultivated	0 wild
Sugarland Mt.	8 "	2 "
Greenbrier Area	1 "	0 "
Total bushes destroyed	14 "	2 "

Total acreage of pine covered	1825
Number man days	35

Estimated cost

Labor	$35
Supervision	218
Total	$253

Future Work

"As a whole with a little scouting each season, blister rust can be kept out of the Park, because of easy accessibility to pine areas for inspection and the comparatively few Ribes that occur within infection distance". Manley

Records

A series of topographic maps of the Park area have been sent to the Washington Office by Mr. Manley, showing the location of scattered white pine, better stands of white pine representing over 5 per cent of the stand, and location of Ribes, including the ones destroyed near white pines and bushes distant from the pines.

Recommendations.

I. It is recommended that a detailed record of all home sites in the Park area be kept with accompanying map showing location, perhaps by number and name of present or former occupant.

The record might show:

1. Whether site is still occupied.
2. Whether any white pines are growing within 900 feet and if so in what quantity.
3. Whether the home site has been examined for cultivated currants and gooseberries, with date of examination and name of examiner.
4. Whether any currants and gooseberries have ever been found; If present, species and numbers.
5. Disposition if any of the bushes.

II. It is recommended that the existing white pine data and maps be considered only as a starting point rather than as final, and that the data be revised every 5 years, and that those areas of scattered pine that have

changed their classification and have become worthy of protection, be surveyed for Ribes at that time.

Perhaps the criterion of value (i.e. worth protection) should not be a certain per cent of the stand, but a minimum of say 20 trees per acre, and the minimum area - 5 acres.

SUMMARY OF ERADICATION WORK IN TENNESSEE IN 1933
(All Initial Work)

	National Forests	National Park	Total all lands
Acreage worked	8,895	1,825	10,720
Number of Ribes pulled	62,856	16	62,872
Man days labor and super.	301	81	382
Cost of control work	$848.68	$200.15	$1,048.83
Total acreage of white pine protected	-	-	5,932
Acres worked per man day labor plus super.	29.5	22.5	28.0
Cost of work per acre	0.095	$0.109	$.098
Number of Ribes per acre	7.1	0.01	5.8

VIRGINIA

Policy

The State of Virginia is cooperating with the United States Department of Agriculture on the same basis as in 1932, the State making available $ 1010 , and the Federal Government $38000 for the biennium ending 6/30/35. In addition the Federal Government through its Emergency Conservation Work made additional funds available for blister rust control work, the work to be in charge of Forest Supervisors on the George Washington and Unaka National Forests, and the Park Superintendent on the Shenandoah National Park, and the State Forester on lands outside of the national units. The Division of Blister Rust Control has had technical direction of the work.

Personnel

There has been no permanent personnel working on blister rust throughout the entire year. Six men, however, excluding District Leader have worked in Virginia this year:

Unit	Checker	Date Work Began	Date Work Closed
George Washington National Forest	W.J. Cullen	Aug. 9	Oct. 11
" " " "	G.U. Wolcott	June 16	Sept. 30
Unaka National Forest	W.H. Robens	July 17	Oct. 6
Shenandoah National Park	E.H. Francis	June 1	Continued thru Dec. 31
" " "	D.H. Fitzwater	July 6	Aug. 15
State C.C.C. Camps	Clyde Stevens	Aug. 10	Continued thru Dec. 31

In addition eradication work has been carried on by Forest Ranger, Abner Casey, on the George Washington and by Mr. Payne on the Watershed of Dry River, owned by City of Harrisonburg. Nursery inspection sanitation work has also been carried on by Mr. C. R. Willey of the Virginia Department of Agriculture, and Mr. R.A. Sheals of the U.S. Department of Agriculture.

The Blister Rust Problem

This serious forest pest which in 1932 we knew only on the leaves of currants or gooseberries in Virginia, has been found in 1933 to have been present on white pines in Augusta County for the past eight to twelve years, and in Madison County for at least two years. The rust has now been reported from the five counties of Augusta, Frederick, Madison, Page, and Rappahannock. It is probably present in the other northern counties. We know of no great damage as yet to the pines in the state although in one area of 1.5 acres in the George Washington National Forest 23 out of 40 white pines or 57.6% were infected, and some were almost dead. The disease spreads rather slowly at first causing spot infections at widespread points. The protection of the native white pine stands, plantations, ornamental pine, and pine in the nurseries before they become damaged by this disease is our problem.

Acreage of White Pine

The data as given in 1932 on white pine acreage by Mr. Cope still stands for the 11 counties named:

County	Acres in white pine 5% or better	County	Acres in white pine 5% or better
Alleghany	9,000	Carroll	75,000
Amherst	8,000	Floyd	35,000
Augusta	18,000	Highland	12,000
Bath	28,000	Rockingham	25,000
Bland	8,000	Wythe	11,000
Botetourt	4,000		

In addition to the above, Mr. Chapin Jones of the Virginia Forest Service wrote that he believed there were at least 1000 acres of white pine in the following counties:--Scott, Russell, Washington, Tazewell, Smyth, Grayson, Patrick, Franklin, Montgomery, Giles, Craig, Roanoke, Bedford, Rockbridge, Nelson, Greene, Madison and Fauquier.

Mr. Clyde Stevens, State blister rust checker, has already found several hundreds of acres of white pine in other counties, viz., Albemarle--610 acres; Page--900 acres; Rappahannock--85 acres; and Shenandoah, Frederick, Warren and Clarke Counties are all known to have white pine.

White Pine Lumber Production*

1927	3,683,000	Ft.	B.M.
1928	6,137,000	"	" "
1929	6,418,000	"	" "
1930	9,820,000	"	" "
1931	8,037,000	"	" "
1932	3,648,000	"	" "

* Figures according to United States Department of Commerce, Bureau of the Census. The white pine lumber cut of 1931 was worth at $21.49 per M ft., $172,715.00 f. o. b. mill. The lumber cut of 1932 was worth at $20.02 per M ft., $73,033.00.

According to Forest Service statistics there are 69 million feet of white pine saw timber, and 376,000 cords of white pine on cordwood areas in Virginia. The cordwood is estimated at 2 cords per M feet to be the equivalent of 188 million feet. The stand of saw timber and cordwood would thus total 257 million board feet.

The saw timber is estimated as worth	$473,340
And the cordwood " " " " "	658,000
The total value thus being	1,131,340

Plantations

Prior to 1921 the records for plantations are incomplete, but probably between 25 and 50 acres of white pine had been set out. Between 1921 and 1934, 97,300 white pines had been distributed for planting in Virginia by the State Forest Service to over 160 places. The pines that were shipped in lots of 1000 or over went to 26 places.

Nurseries Growing White Pine

State Forest Nursery, Charlottesville

Westcotts Nursery, Falls Church

J. B. Watkins & Bros., Midlothian

Alta Vista Nursery, Alta Vista

Stabler Nursery, Fairfax

W. E. Shawalter, Vienna

Titus & Co., Waynesboro

Campbell County Nurseries, Lynchburg*

Hedge Lawn Nursery, Roanoke *

Moses Nursery, Waynesboro *

Simmons Nusery, Longdale *

Valley View Greenhouses, Charlottesville *

Mrs. E. C. Arey, Danville*

W. T. Hood & Co., Richmond

* Grow small quantities of white pine for use in immediate vicinity of nursery.

Nursery Sanitation

Four of the above nurseries have applied to the Bureau of Plant Quarantine for permit to make interstate shipments. These nurseries and their environs have been examined either by R. A. Sheals, Roy G. Pierce, or Clyde Stevens. Titus Nursery Company has been given permit to ship to infected States. Westcott Nursery, Alta Vista Nursery, and Jones Nursery Co. have been given a permit to ship any place in the country except to the Southwestern States.

At Titus Nursery--Stevens destroyed 101 wild black currants growing within 1500 feet of nursery.

At Westcotts Nursery--the Company destroyed their own cultivated currants.

Cooperation

The Bureau of Plant Industry has cooperated this past year with the Virginia Forest Service and the Virginia State Entomologist. The State having expended $28.28 for first half of year and $ 130.66 for second half year; and the Bureau of Plant Industry $456.21 for first half of year and $137.64 for second half year making a combined total for the calendar year of $593.85 for the Federal Government. In addition to the above expenditure the Federal Government through its C.C.C. Camps has expended considerable sums on blister rust control. A tentative summary has been made of the expenditures showing at least $10,946.95 spent during the year.

George Washington National Forest:

At C.C.C. Camp 2.....	$596.89
At C.C.C. Camp 4.....	495.27
Total.....	$1,092.16
Unaka National Forest.....	$453.37
Shenandoah National Park.....	$8,459.11
Virginia State Camps.....	$942.31
	$10,946.95

This includes total salary of 5 checkers for period they worked but laborers wages at $1.00, $1.20 or $1.50 as the case might be for actual days labor expended. Transportation is also included.

Black Currant Elimination

No definite survey was launched to get rid of the European black currant in the State, nor were any of these bushes destroyed by blister rust control agents. The only list of black currants in Virginia was compiled furing the year 1916 and 1921. This is given below:

BLACK CURRANTS IN VIRGINIA
1916-1921 Incl.

County	Town	Name or Specific Location	Number and Kind
Albermarle	Charlottesville	R. H. Wood	12 - Black
Allegeny	Clifton Forge	G. Coupps	6 - Black
"	"	W. H. Crawford	6 - Black
"	"	M. C. Green	6 - Black
Bath	Hot Springs	G. M. Keyser	3 - Black
Campbell	Lynchburg	Mrs. I. Bell	3 - Black
"	"	Va. Episcopal School	20 - Black
Chesterfield	Midlothian	J. B. Watkins	25 -Nigrum
Clarke	Boyce	Mr. Gilpin	3 - Black
"	Berryville	Mrs. S. F. Baughan	5 -Nigrum
"	Whitepost	Graham Blandy(The Tuyleries)	12 -Nigrum* Destroyed '32
Montgomery	Blacksburg	Va. Polytechnic Institute	15 -Nigrum
"	East Radford	J. T. Howe	25 -Nigrum
Nelson	Oak Ridge	T. F. Ryan	150 -Nigrum
Roanoke	Roanoke	J. P. Blackenship	20 - Black
"	"	J. W. Boudurant	12 - Black
"	"	Mrs. J. A. Carter	5 -Nigrum
"	"	T. H. Ferrell	3 -Nigrum
Rockbridge	Lexington	Lucy Northern	1 - Black
Scott	Gate City	B. J. Broadwater	2 - Black
Washington	Abingdon	Mrs. J. C. Ieson	2 -Nigrum
"	"	J. M. Kreger	3 - Black
Wise	Appalachian	Mrs. C. A. Cress	6 - Black
"	"	Mr. Adams	1 -Nigrum
"	Big Stone Gap	G. J. Muney	8 -Nigrum

* 4 living in 1932 destroyed by owner November, 1932

Note: The records above do not state that Ribes nigrum was present at each place. Sometimes they are listed only as black currants. This may include Ribes americanum as well as Ribes nigrum.

Educational Work in 1933

	No. of Meetings Addressed	No. of Persons at Meetings	No. of Posters Distributed	No. of publications Distributed	No. of Contacts Made (Estimated)
W. J. Cullen	-	-	-	-	20
G. U. Wolcott	-	-	-	-	20
E. H. Francis	2	225	-	200	50
Clyde Stevens	2	120	4	140	100
A. H. Robens	-	-	-	-	30
Total	4	345	4	340	220

In addition to the above educational work carried on by the Blister Rust Checkers in the various C.C.C. camps considerable educational meterial was sent by the Washington Office to Prof. Edw. M. Betts of the University of Virginia including 44 slides, specimens, photos, and publications. A circular letter was also sent out to the Biology Departments of 26 higher colleges and universities in the State on May 28 apprising them of the presence of blister rust in the State and the value of the pines and that the work of control was being started and asking for their cooperation.

While I have seen no newspaper items, on the blister rust, in Virginia papers I gave an interview to an Associated Press reporter in Virginia who probably used the material in papers in the State.

Virginia Annual Report

Blister Rust Control on Private Land

Foreword

While control work was begun on Federal lands in Virginia in 1928, it was not started on private lands until 1932. In that year Ribes eradication began on the watershed of the City of Harrisonburg, a City owning 800 acres of land on Dry River above Rawley Springs, with excellent stands of young and immature pine. Men employed by the City of Harrisonburg carried out the Ribes eradication themselves removing approximately 10,200 wild gooseberries from 800 acres. The Division of Blister Rust Control gave the workmen technical direction at first, and after completion checked up the work.

Scouting for the blister rust has been carried on in the State for a period of 24 years, the first in 1910, then from 1917 to 1920 inclusive, and from 1928 to date. The rust has only been located in the State since 1931, though we now know it was present in Augusta County for at least 9 years and possibly 11 years.

Personnel

Mr. Clyde A. Stevens, a forestry graduate from the University of Maine, was employed by the State Forest Service on the recommendation of the Division of Blister Rust Control as blister rust checker to work out of the State E.C.W. camps in northern Virginia. Mr. Stevens had already had some experience in blister rust control in Maine. He began work on August 10, 1933 and has continued up to the present time (February 15, 1934). He was assisted by one local man from each of the three E.C.W. camps at Grottoes, Moormans River and Sperryville.

District Worked

The work in 1933 was concentrated in northern Virginia on lands immediately adjacent to the Shenandoah National Park, in the Counties of Albemarle, Augusta, Greene, Madison, Page, Rappahannock and Rockingham. This region was known to have the blister rust and known to have numerous small pine areas, some of them infested with Ribes.

Method of Work

The first work was that of nursery sanitation around the Titus & Company nurseries, near Lyndhurst and Lipscomb, southwest of Waynesboro where American black currants were known to be present within 1500 feet of the white pines in the nursery. 101 Ribes americanum were destroyed on 3 acres near the nursery. These bushes were growing in moist land close to the South River, and were the only bushes of this species found in the State in the past 5 years. Some cultivated bushes still remain at 3 homes within the protective zone. Their removal is up to the Nursery.

The remainder of the year was spent in scouting for white pine and Ribes and in mapping all pine areas where this species ran above 5% of the stand. Beginning at the nearest land to the E.C.W. camp, each watershed was scouted for pine. Mr. Stevens used his own auto to get as close to the watershed as possible, but the majority of the work was done on foot.

Results of The Scouting

Up to October 31, 1933 the following areas were covered in scouting.

County	Area of White Pine (acres)	Total Area of Pine & Protective Zone. (acres)	Area Scouted But Not Completed, acct. presence of Ribes	Area Completed.- No Ribes Present. (acres	
				White Pine	Total Area including White Pine & Protective Zone
Albemarle	610	3799	687	472	3112
Greene	124	1356	593	71	763
Page	70	714	200	30	514
Rappahannock	85	1105	274	65	831
Rockingham	216	1827	118	211	1709
Total	1115	8801	1872	849	6929
Titus Nursery, Waynesboro, Va.	1	280*	—	—	—
Grand Total	1116	9031	1872	849	6929

*At the Titus Nursery 101 American black currants (R. americanum) were removed.

In addition to the above survey carried out during the growing season when Ribes were visible, scouting for pine was continued in Page County to the end of the year. 3350 acres of pine land were scouted and mapped. Some of these pine areas are at an elevation of 1500 feet or lower, and are likely to be Ribes free, for 1500 feet is close to the lowest elevation in Page County for wild Ribes.

Work Remaining

There still remains a considerable acreage in Page, Warren and Rappahannock Counties which have not been scouted for pines. The pine bearing areas in the vicinity of the National Park will be completely scouted in 1934. All of the areas surveyed since November 1, must be scouted in the spring for Ribes, particularly those above 1500 feet elevation.

Work Planned

It is planned in 1934 to eradicate the Ribes in those pine areas having 5% or more white pine in the stand, if this meets with the approval of the State Forester. The work will be carried on from the nearest E.C.W. camps using not over 4 men at a time from each camp. When the scouting and eradication work is completed it is planned to continue similar work from other State E.C.W. camps, beginning at the north and proceeding south.

It is also planned to reexamine the areas at the Titus Nursery Company for any American black currants or other wild Ribes which may have been missed in 1933.

COST DATA FOR WORK ON PRIVATE LAND

Blister rust checker: Clyde Stevens, salary.....	$652.91
" " " : Transportation.....	$194.40
Labor 95 man days @ $1.00 per day.....	$ 95.00
Total cost.....	$942.31

Virginia Annual Report

George Washington National Forest

Introduction

Blister rust control was started on this forest in the fall of 1928, 1933 therefore being the sixth consecutive year in which some work has been carried on, mainly in the Dry River and Deerfield Ranger Districts.

Ribes Eradication

This was carried on mainly in the North River Watershed of the Dry River Ranger District, and consisted both of initial work and reworking of the pine areas. Mr. Abner Casey, Forest Ranger, worked about 800 acres of land, including approximately 100 acres of pine in Little River. 512 Ribes were pulled with four days labor at a cost of $9.00, not including Ranger's time valued at $1.25. Local labor was hired by Mr. Casey for this early work.

Larger scale work was carried out by Mr. W. J. Cullen, blister rust checker, who has had some 15 years' experience in blister rust control in New Hampshire. He began his work out of C.C. Camp #2, located near Staunton Reservoir, on August 9. In brief Cullen was responsible for covering 606 acres by advance scout method, and for covering an additional 1504 acres with two crews, a total of 2110 acres. Crew work stopped October 6th. The number of laborers varied from six to twelve. The average number of effective hours work per day was 6.5 for labor, and 6.7 for supervision. The Ribes found were of two species, Ribes rotundifolium and Ribes cynosbati.

A comparison of work in 1929 with that of 1933 was made. In 1929 the work was carried on by three men in wide strips. Only 1362 Ribes were found and pulled that year. In 1933 the work was carried on by five men

and foreman working in narrow strips, and 2401 Ribes were pulled. On the 719.3 acres reworked this year in Block I, the bushes averaged only 3.3 per acre.

The following table gives the data on eradication in North River and tributaries carried on by C.C.C. men from Camp#2 on Broad Run.

Kind of Work	Total No. of Man Days			Total No. of Effective Hours	
	B.R. Checker				
	Supervision(1)	Repts. & Records	Labor	Supervision	Labor
Initial Work	18	-	172	101	1100
Reworking	24	-	104	169	666
Combined Initial & Reworking	42	17.6	276	270	1766

(Continued)

Kind of Work	Area Worked in Acres				Worked per Man Days Labor	Area covered by Crew per Man Days Labor
	White Pine	Total Area including Protective Zone		Worked by Scout & Crew		
		Worked by Scout	Worked by Crew			
Initial Work	130	162	568	730	4.2	3.3
Reworking	362	444	936	1380	13.2	9.0
Combined Initial & Reworking	492	606	1504	2110	7.6	5.4

(1) Supervision is here used as the Forest Service used it to include time spent by checker in scouting and eradication, but not the time spent on reports and records.

Kind of Work	Number of Ribes Bushes Pulled						
	Total			Per Acre			In Area Covered by Crew per Man Days Labor
	By Scout	By Crew	Pulled by Scout & Crew	By Scout	By Crew	By Scout & Crew	
Initial Work	111	6410	6521	0.7	11.3	8.9	37.2
Reworking	14	5347	5361	0.03	5.7	3.9	51.4
Combined Initial & Reworking	125	11,757	11,882	0.2	7.8	5.6	42.6

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Kind of Work	Costs Supervision (2)	Labor (3)	Transportation (4)	Supervision, Labor, & Transportation.
Initial Work	$127.32	$175.67	$6.85	$309.84
Reworking	170.16	106.23	10.66	287.05
Combined Initial & Reworking	$297.48	$281.90	$17.51	$596.89

(2) Total Salary for period worked Aug.9-Oct. 11 incl.
(3) This represents 29.5 days labor at $1.20 per day and 246.5 days labor at $1.00 per day.
(4) Data supplied by W.J. Cullen

Kind of Work	Supervision Costs Per Acre White Pine	Supervision Costs Per total Area Wkd. (4)	Labor Costs Per Acre White Pine	Labor Costs Per total Area Wkd. (4)	Combined Supervision Labor & Transportation Costs Per Acre White Pine	Combined Supervision Labor & Transportation Costs Per total Area Worked (4)
Initial Work	0.98	0.17	1.34	0.24	2.38	0.42
Reworking	0.47	0.12	0.29	0.08	0.79	0.21
Combined Total	0.60	0.14	0.57	0.13	1.21	0.28

(4) This represents total area worked by crew and scouts.

Blister Rust Spread

Mr. W. J. Cullen while on a reconnaissance trip through the Dry River Ranger District with Roy G. Pierce taking in North River, Little River, Big Run, Briery Ranch and a trip to Sugar Grove, West Virginia, discovered the blister rust for the first time on the Forest on August 7th. Both white pine and Ribes were found diseased at Milestone 12.6, 2 miles up North River from Camp Todd. This was in an area from which Ribes had never been removed because of the scarcity of the pine. Later on September 12, Cullen studied the infection area and reports on it as follows:

This area consisted of 1.5 acres.

No. of pine on plot - - - - - 40
No. of pine infected- - - - - 23
Percent infected- - - - - - - 57.6
Year of oldest infection- - - 1924
Year of youngest infection- - 1928

Ribes found: -

11 infected Ribes cynosbati, 2-4 feet in height.
Predominating tree species on plot - - hemlock.
Percent white pine on plot - 6.
No. white pine seed trees - 7.
Age of pine - 10-40 years.

Later three infected pines and one infected Ribes were found in Block C of Area #1 (Cullen's Maps) about 40 chains south of Camp Todd, close to the road. Cullen and Pierce examined these trees and it seemed to the latter that the infection dated back about 11 years on one tree. Another infection was found down North River some ten miles distant from the first location.

Future Work and Recommendations for District in Vicinity of C.C.C. Camp #2.

Some scouting in 1934 should be carried up the three branches of Skidmore Run, a tributary of North River. Cullen and Pierce found some good white pine in one run in the fall.

In 1934 the north and south forks of Little River and Curlin Camp Hollow and Mt. Solon Hollow, both tributaries of Hone Quarry Branch, should be scouted and if sufficient Ribes are coming in, the areas should be re-worked. Some of the upper branches of the smaller streams have not been scouted intensively for pine, these include Stony Run, Coal Run, Big Run, and Hog Run, tributary to Little River, Wolf Run, and Mines Run, tributary to Briery Branch, Still House Creek, and the several branches of White Oak Creek, tributary to North River.

It is not known whether there is sufficient white pine in any of these Runs to warrant protection. Lynn Hollow and Sinclair Hollow in Highland County are reported by Fire Warden McCray as having white pine and it would pay to scout them for Ribes.

Brocks Gap Division

Mr. G. U. Wolcott, blister rust checker, carried on a detailed survey for pine areas in this Division from June 16 to August 15. Since Mr. Wolcott has furnished both the Forest Service and the Division of Blister Rust Control with a five-page report accompanied by maps of this survey, I will only tabulate his results.

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No. of Area	Name of Run	Area of W. Pine (acres)	Area to Work	Ribes Conditions	Area Scouted	Distance from nearest Camp at Fulks Run, Va. (In mi.)	Estimated Time Required To Work
1	Rocky Run	20	40	1-25 per A. (9 pulled)	250	20	5 men & boss-4 days
2	Long Run	25	60	Few (8 pulled)	200	15	" " " " " " "
3	Big Laurel Run on State's Atlas Little Laurel on ½" maps.	90	200	Abundant (10 pulled)	300	31	5 men & boss-for from 10 to 14 days.
4	Little Laurel Run on State's Atlas, Big Laurel on ½" maps.	8	0	Fairly Abundant (13 pulled)	225	30	White Pine not over 30 per A. and this no. only in better places. Eradication not suggested by Wolcott.
5	Low Place Run	6	0	Present but not Abundant (3 pulled)	40	30	White Pine not over 25 Per A. even in best places. Eradication not suggested by Wolcott.
6	Hog Pen	10	0	0	175	11	No. erad. necessary
7	Slate Slick Run	3	0	0	200	10	" " " W. Pine less than 1%
8	Whetstone Run	0	0	0		10	" " " "
9	Cross Mt. Run	5	0	0		10	No. erad. necessary
10	Buck Lick Run	20	0	0	175	11	" " "
11	Root Run	4	0	0	50	13	" " "
12	Church Mt. Run	12	0	0	400	15	" " " Pine less than 1% in most places
13	Sours Run and Supin Lick Mt.	0	0	0	50		No erad. necessary Pine less than 1% in most places
14	Capon's Run	0	0	0	75		Scattered pine, less than 1%
15	Govt. land north of Stony Run and South of Rattlesnake Run	0	0	0			Less than 1% White Pine.
16	Carr's Run	20	0	0 (4 pulled)	200		No erad. necessary Ribes found above pine

(Continued)

No. of Area	Name of Run	Area of W. Pine (acres)	Area to Work	Ribes Conditions	Area Scouted	Distance from nearest Camp at Fulks Run, Va. (In mi.)	Estimated Time Required to Work
17	70 Buck Lick Run	25	0	0	250		No erad. necessary. Ribes found above pine.
18	Clay Lick Run	30	0	0 (8 pulled)	300		" " " " " " " "
19	Straight Hollow	?			450		No recommendation made
20	Dull Hunt Run	?			1590		" " "
21	Brier Run	?			325		" " "
22	John Payne Run	?			75		" " "
	Totals	258	300	55	5630		

A summary of Wolcott's scouting in Virginia shows an area of 5630 acres covered in two months. White Pines were found in 14 areas or Runs. Ribes were only located in three areas where pine were sufficiently valuable to recommend eradication, viz., Rocky Run, Long Run, and Little Laurel Run (of the ½" scale maps). To clear out these Ribes would take 18 to 22 days for five men and a boss or from 108 to 132 man-days.

COST - Supervision $284.00
34.60
$318.60 in Va.

RECONNAISSANCE SURVEYS

Massanutten Division

R. G. Pierce made a hasty survey of this Division at the time of the establishment of the first C.C.C. Camp Roosevelt in Fort Valley between April 27 and May 3. Areas scouted were those suggested by Ranger Chrisman, or stumbled on by the writer. The following areas were scouted, all but one being apparently free of Ribes.

Name of Area	Elevation in feet	Area of W. Pine (acres)	Area Scouted (acres)	No. of Ribes Found
Little Passage Creek at Mud Hole Gap	1200 to 1400	8 F.S.*	75	0
Mine Run	1200	1 F.S.	1	0
Mill Run below Veachs Gap	900-1100	15 F.S. 10 Priv. land	100	0

(Continued)

Name of Area	Elevation in feet	Area of W. Pine (acres)	Area Scouted (acres)	No. of Ribes Found
Mountain Run	1200	10 Priv. land	40	0
**Chrisman Hollow, Upper end of Passage Creek	1200 to 1400	75 F.S.*	150	Abundant on 7 acres
Duncan Run near Camp Roosevelt	900	10 F.S.	25	0
Cub Run above Jct. with Roaring Run near Newport		120 F. S.	200	0
TOTAL		229 F.S. 20 Priv.	591	Abundant in one location

*Plantations of white pine are included in these areas.

**It is suggested that the Ranger be instructed to proceed with Ribes eradication in the spring of 1934, the area to be worked extending along the creek between Mileport 2.6 and 3.0, and comprising about 7 acres. The time to work the area will be about one day for five C.C. men.

Note: White pines are apparently scattered over the western slope of the Massanutten for I have had reports of white pine and gooseberries west of Woodstock Gap, and have observed (Nov.2) scattering white pine seed trees south of the road to New Market Gap with groups of young trees from 1 to 12 feet in height near by. 54 white pines of all sizes were observed over 5 acres of steep mountain side in the first valley south of the main road through New Market Gap. Above the pines and at some distance Ribes were found in the rock drifts. It is likely that there are numerous areas on the west slope where white pines are coming in in sufficient quantity to be worth protecting from the rust, but this will take considerable scouting to locate them.

Roy G. Pierce
Associate Pathologist.

Virginia Annual Report

Unaka National Forest

Foreword

This Forest lies in southwestern Virginia, in Carroll, Grayson, Smyth, Washington and Wythe Counties, and in the northern Counties of Tennessee. Prior to 1933 no blister rust control work had been carried on, nor any extended survey for Ribes, nor were Ribes known to be present in white pine stands. White pine is found growing in the Forest in both the New River and Holston working circles.

Work in 1933

At the suggestion of this Office the United States Forest Service designated Mr. Ward H. Robens, one of their cultural foremen on the Unaka, who had already a season's blister rust control experience, to carry on such survey and control work on the Forest as the Supervision designated. Mr. Pierce outlined method of survey for pine and Ribes and eradication of the latter to the Forest Officers from July 13 to July 17 inclusive, also making a reconnaissance with Mr. K. D. Menze on two planting sites in Tennessee, and with Mr. Sipe on July 15. Mr. Robens commenced work on July 17. Prior to this time (June 19) Supervisor Graham had issued a Memorandum For Project Superintendents, as follows:

Bristol, Tenn.,

June 19, 1933

MEMORANDUM FOR PROJECTS SUPERINTENDENTS:

Gooseberry bushes have been discovered near one camp at a much lower elevation than was previously known and in an area with a large percent of white pine. This means that we are open to the attacks of the white pine

blister rust. Ribes have previously been found plentifully at elevations of 4000 - 5000 feet, where white pine was rare.

Until further notice, cultural and road foremen will have their crews watch for, pull and hang up all bushes of gooseberry found on Government land. The presence of wild bushes on private land will be noted. Cultural foremen will make written note of number of bushes and specific location. If possible, the timber stand improvement crews should be introduced to the Ribes genus so as to be able to identify it, by examining cultivated bushes if necessary.

A brief report should be submitted monthly by the Project Superintendents covering the number and location of bushes.

/s/ C. L. GRAHAM

Forest Supervisor.

The bush referred to in the memorandum was found by Pierce to be an escaped cultivated gooseberry growing at an elevation of about 2000 feet, just over the State line in Tennessee, south of Damascus, Virginia.

Cooperation

The Supervisor, on July 19, issued a Preliminary Plan for White Pine Blister Rust Control Work on the Unaka, which was sent to all Project Superintendents and Forest Rangers. This memorandum outlining the work, introducing Robens to the various camps, and calling for cooperation of all foremen in reporting Ribes and in certain cases eradication of the Ribes found, aided very considerably in Mr. Robens work. The memorandum follows:

Bristol, Tennessee,

July 19, 1933

WHITE PINE BLISTER RUST CONTROL

Unaka National Forest

Preliminary Plan

Introduction

White Pine Blister Rust has been found on Ribes (Currants and Gooseberries) about two hundred miles north of the Unalon, near Luray, Virginia. However, it may be nearer or actually on the Forest. It is, therefore, necessary to determine the Ribes and White Pine condition as soon as possible on the entire Forest. As a general policy, eradication of Ribes (if found in sufficient amounts) will be needed where White Pine of all ages forms 5% or more of the number of stems per acre.

General Plans

Mr. Roy G. Pierce, of the Bureau of Plant Industry, will assist in organizing this work. For E. C. W. the line of responsibility will be as follows: Forest Supervisor — Staff Assistant in charge of T. S. I. work — Project Superintendent — Blister Rust Checker — Scouter — Eradication Crew. Ward H. Robens has been assigned as Blister Rust Checker at $167.00 per month. After Mr. Pierce has outlined the work to the checker, the latter will then train one or more scouters and eradication crews at F-5-Virginia. It is necessary that all men selected and trained for this work be good, dependable workers, the scouters and crew leaders being especially so. The use of $36.00 and $45.00 men should be considered; it is generally desirable to have the same wage class of men doing this work in each camp.

Since Ribes and White Pine have been found together at F-5-Virginia, this area will be organized first. The checker will later move to other camps and train scouts, and, if necessary, eradication crews. All men in the scout and crew class will be enrolled men, with the possibility of using local men being considered.

Reference is made to my memo. to Project Superintendents, dated June 19, filed S-Disease Control. Effective at once the following policy will be adhered to: road, cultural, or other foremen will watch for Ribes, and report number, location, and size to the Project Superintendent. If the bushes found are few enough so that the foreman's regular work will not suffer, they should pull and hang up also. Enrolled men in cultural crews will not make any effort to locate Ribes, since it is felt that their primary effort should be concentrated on tree crowns, rather than the ground. The use of a special Ribes man in cultural crews will be discontinued

at once, unless it conforms to instructions of recent date as to a strawboss doing this along with other miscellaneous work.

The occurence of White Pine should also be reported to the Project Superintendent.

A report covering technique, tools, transportation, records, map and other phases will be prepared as soon as possible by the Checker. For existing information, refer to Mr. Pierce's instructions, copy of which has been furnished Robens and Sipe.

Keys and descriptions of the various species of Ribes have been requested and will be forwarded each camp later.

C. L. GRAHAM,
Forest Supervisor.

Instructions

Mr. Robens issued definite "Instructions For Scouts", for it was his purpose to train men in each C. C. C. camp to carry on the actual scouting, mapping, and Ribes eradication and then to check up on the scouts work for efficiency. These instructions are reproduced here:

BLISTER RUST CONTROL
UNAKA NATIONAL FOREST

INSTRUCTIONS FOR SCOUTS

INTRODUCTION

The rapid approach of white pine blister rust from the northern states makes it important to protect the white pine on the Unaka from the disease. The only effective means of accomplishing this consists in destroying Ribes (genus name for gooseberries and currants) on which blister rust lives during part of the year.

The eradication of Ribes will be carried out on all areas where white pine of all ages form 5% or more of the number of tree species per acre of forest and on a protective zone, 900 feet in width completely encircling all such areas.

SCOUTING

Two scouts from each Civilian Conservation Corp Camp on the forest will work together at all times in carrying out the task of scouting the area assigned the camp. It is felt that a greater degree of safety from accidents in the woods will be achieved by the scouts working in pairs.

The object of all scouting in the forest will be two in number.

1. To determine the location of all white pine areas which constitutes 5% or more of the stand.

2. Determine the size of the job of Ribes eradication in and about such stands of white pine.

SCOUTING FOR RIBES

Having determined an area in need of ribes eradication, the scouts will run parallel lines through the area and the surrounding 900 foot protective zones at a distance of twenty-five to fifty feet apart. This distance between lines should be maintained, especially in coves, bottomlands, and along rock slides where one or more bushes are likely to be found during every 100 yards of progress. On dry slopes and ridges where bushes are found at much less frequent intervals a distance of 200 feet or more between scouting lines is sufficient.

OCCURRENCE OF LARGE GROUPS OF RIBES.

A concentration of 50 - 100 bushes on a single acre will be destroyed by the scouts without the use of a crew. Only when a large number of Ribes (50 - 100) per acre are found over an area several acres in extent will the use of a crew be justified. Scouts will be furnished with a light, short handle pick for aid in uprooting the large bushes. Gloves should also be carried for protection from the spines on the bushes. Scouts will make it a point to completely remove all the large roots of each bush.

When enough Ribes are found to warrant use of a crew, the scouts will mark the position of the patch by a line of small, double blazes to a trail, road or some natural feature easily found by the crew foreman sent to eradicate the Ribes.

IMPORTANT POINTS FOR SCOUTS

The success of the eradication work invariably depends on the scout. He must develop an ability for handling himself in the woods, have keen eyesight, good judgement, and must be extremely conscientious in his work. On him will depend the quality of protection afforded the pine by the Ribes eradication.

Scouts will be systematic rather than haphazard and each area will be worked in order, so that definite sections of the forest will be finished by the end of the season. Exception to this may be made when transportation problems interfere.

Early scouting may show the type of ground where Ribes occur or where they do not. Near C. C. C. Camp F-5-Virginia this type of ground is the deep, black, poorly drained soil with the bottomland type of plant growth. Use this knowledge in later scouting, but do not neglect to scout all times, the y type of area which heretofore has shown no Ribes.

NOTEBOOK

One of the two scouts will carry notebook in which to record the following;

1- Prospective pine planting areas - location, size, etc.

2- Approximate size, location and number of Ribes where sufficient to justify use of a foreman and crew.

3- Small sketch of unit being worked to show approximate location of streams, other minor topographical features, and position of all Ribes bushes pulled.

REPORT FORMS

CARDS

Scouts will report all Ribes pulled on card forms (B1) carried in notebook. As soon as each unit of the forest is completed the scout will turn in the card or cards to Project Superintendent.

PINE AREA SHEETS

The scout using the notebook will transfer all notes from it concerning pine areas to the pine data sheet Form BRP-1 as soon as each unit is finished. One sheet will be made out for each of the principal pine stands on the unit.

MAPS

Outline maps of each unit will be furnished the scout on which they will indicate the following:

1- White pine areas (Stocking - pine making up 5% or more of the number tree species per acre.
2- White pine planting sites.
3- Minor topography within the unit.
4- Areas where Ribes were destroyed.

The scouts doing the map work will date and sign map and turn it in to the Project Superintendent.

These outline maps will also be kept in the Project Superintendent's office during process of work upon them.

TRANSPORTATION

Scouts will travel by T.S.I. or road crew trucks or on foot to reach the scene of work. Lunches will be carried for the noon meal when distance from camp or from a T.S . I. using "Marmite" cans for meals would make lunch periods unnecessarily long.

RESPONSIBILITY

One scout will report each night immediately after working hours to the Project Superintendent concerning the day's progress and the location of the following day's work. He will also report effective hours worked.

The presence and location of groups of Ribes which, in the scout's opinion, warrant the use of a foreman and crew for eradication will be reported to the Project Superintendent. The final decision as to the necessity of an eradication crew will also remain with the Project Superintendent.

RIBES RECORD

W.C.			Number bushes found			
Date	Unit	Map No.	R. cynos.	R. rotund.	R. sp.	Action

Form - B-1

Date	Unit	Map No.	R. cynos.	R. rotund.	R. sp.	Action

Form - B-1

The above shows the front and back of a 3 x 5 card.

Method of Scouting

Mr. Robens developed a method of scouting, after trying out the stereotyped gridironing system which was suggested at first. In a letter of October 2, to Pierce, he describes this system:

"As you may remember, on your visit here in the middle of the summer possible locations for Ribes were examined. The one bush found during your inspection of the areas was located in the bottomland type of cover in a small cove. No bushes were found on the dry slope type of cover, so common on this forest. In all the scouting that I have directed since then, this same condition has invariably proved to be the case. After having the scouts run many miles of scouting lines across these dry slopes, carefully gridironing the areas in the customary manner, but without obtaining results, I decided to follow a different procedure.

Basing my course upon what I had found in the way of location of Ribes, I determined five distinct site-areas which scouts are trained to recognize and cover in detail. These are the following:

1.- Bottomlands.
2.- Coves.
3.- Rockslides and ledges.
4.- Ridge tops.
5.- Stands of pure or nearly pure white pine.

Bottomlands either wooded or open are covered by scouting lines at 25-50 feet intervals. Since I use two scouts in company at all times each works a line keeping approximately abreast of each other. A serpentine or quartering course is followed by each scout so that a strip 25-50 feet wide is covered rather than a single narrow line.

All coves including the smallest dry stream courses are followed, the narrow ones being worked by having each scout cover the area between the stream bank and the sides of the cove.

In the case of the third site enumerated, scouts examine the areas by lines across the ledges or up and down the rockslides. Slides producing Ribes frequently occur near the heads of coves so that they are covered in conjuction with the cove work.

Very few ridge tops have been found containing Ribes. However, an occasional one will be sufficiently flat topped to have the soil and bottomland type of plant growth preferred by Ribes. This makes it essential that these sites be checked in the scouting.

Where stands of pure or nearly pure white pine occur on the Unaka site factors are usually such that Ribes are likewise present. These spots are covered by scouting lines at short intervals.

That no new sites different from the five above but containing Ribes are not missed, I make a careful check at each new camp visited. This is carries out during my reconnaissance trips to determine location of areas with a sufficient stocking of pine to necessitate scouting. In event any such areas are found the scouts would be directed to cover these places in addition to the others."

Scouting and Eradication Results

In Virginia, work was carried on by two scouts from each of the three C. C. C. Camps at Speedwell, Sugar Grove and Damascus. A table shows the activities from each camp. In Tennessee the work was carried on from the Damascus, Virginia camp, only fourteen days time being spent there.

SCOUTING AND ERADICATION ON UNAKA NATIONAL FOREST IN VIRGINIA AND TENNESSEE IN 1933

Name of town where Camp located and no. of Camp	Speedwell F-5 Va.	Sugar Grove F-6 Va.	Damascus F-7 Va.	Totals for Virginia	Damascus Camp in Tenn.	Totals for Forest
Period work performed -	Jul. 17-Oct. 6	Sept. 11-17	Sept. 18-27	Jul. 17-Oct. 6	Sept. 28-Oct. 6	Jul. 17-Oct. 6
Acreage Of white pines**	986.		220.	1206	375	1581
" covered by checker	100.0	75	46	221	54	275
" " " scouts	4412.	373	824	5609	1066	6675
Acres covered by scouts per 8-hr. man day	44.12	41.4	58.8	45.6	66.6	48.0
Acreage worked	4512	448	870	5830	1120	6950
Ribes pulled: wild	365	18	14	397	0	397
Ribes pulled: cultivated	0	0	0	0	2	2
Man hours enrolled personnel: Eradication hours Ribes	574.4	32.7	73.1	680.2	83.7	763.9
Man hours enrolled personnel: Total* time	800.0	72.0	112.0	984.0	128.0	1112.
Wage of Scouts	$142.50	$10.80	$21.00	$174.30	$24.00	$198.30
Wage of Supervisor	$208.12	$28.38	$42.57	$279.07	$42.57	$321.64
Combined cost of Scouting and Supervision***				$453.37	$66.57	$519.94
Cost per acre scouted (pine area plus protective zone)				$ 0.077	$ 0.059	$ 0.074
Cost per acre of white pine scouted				$ 0.376	$ 0.177	$ 0.329

* Man days calculated by dividing Total Time enrolled men by 8, thus giving an 8-hr. day.

** This includes only white pine occupying 5% or more of the stand.

*** Transportation not included since men rode to work with Timber S tand Improvement Crews.

White Pine Stand

The United States Forest Service data as of January 1, 1931 shows a stand of saw timber in the Unaka Forest in Virginia of 4,285,000 feet board measure, and in Tennessee of 11,443,000 feet board measure. No data on acreage is available.

Reconnaissance

As a result of this past season's work there were areas of white pine totaling 1206 acres surveyed, mapped and scouted for Ribes in Virginia. This represented only areas where white pine constituted 5%, or more, of the stand. The smallest stand mapped in 1933 was one of ten (10) acres, and the minimum number of white pine recorded was 100 to the acre. In Tennessee 375 acres were mapped and scouted for Ribes.

In addition to the above areas scouted intensively, many areas were covered in a reconnaissance where white pines were found too few to be worth consideration for intensive Ribes scouting, or entirely absent. Such areas in the New River Working Circle include Bournes Branch, Coon Branch, Comers Rock, Units 37 and 39 in Criggers Creek, Henley Creek, Jackson Branch, Jones Branch, Pool Spring Branch and West Fork of Dry Run.

Summary of Areas Worked in 1933.

Name of County	Working Circle in Va.	Name of Area	Unit No.	Pine Area No.	Area in Acres – White Pine plus Protective Zone	White Pine Only	White Pine No. per Acre	Age in Years
New River	Carroll	Big Branch	3	1	1427	100 200	800–1000 200–1300	1–70
"	"	" "	7	1	140	100	100– 200	15–75
"	"	Long Branch of Brush Creek	5	1	550	220	800–1000	1–125
"	Wythe	East Fk. Dry Run	27	1	1700	300	200	5–60
"	Smyth	Center Branch Criggers Creek	38	1	325	48	200–300	1–50
Holston	Wash.	Rush Creek	9	1	300	30	100–150	30–60
"	"	Beech Creek	10	1	190	55	100–200	1–70
"	"	" "	11	1	70	15	500–600	20–30
"	"	Mocks Branch	11	2	130	70	500–600	1–30
"	"	Straight Creek	13	1	90	30	100–150	10–60
"	"	Sugar Camp Branch	64	1	40	10	100–200	10–60
"	Smyth	Grosses Creek	95	2	50	10	100–150	5–50
"	"	St. Clair Creek	95	1	75	18	300–400	5–60 60–70
Total in Virginia		13 Areas			5037	1206		
In Tennessee)								
Holston	Johnson	Sugar Camp Branch	64	1	85	35	100–200	10–60
	"	McQueens Knob Br.	23	1	570	150	200–300	5–70
	"	Old Road Branch	28	1	300	150	300–400	1–50
	"	Marshall Slide Br.	24	1	228	40	200–300	5–70
Total in Tennessee		4 Areas			1183	375		

Summary of Areas Worked in 1933

Ribes Destroyed Species	No.	Approximate Elevation in feet of Pine	
rotundifolium	2	2050 – 2300	Ribes bushes found on old Camp site, may have been brought in. Big Br. called Sugar Ridge Br. on USGS.
sp?	1	2400 – 2600	This is a southern Branch of Brush Creek.
–	0	2400 – 2600	This is Long Branch of Brush Creek and is not shown on USGS sheet as such.
cynosbati	43	2640 – 3000	Ribes continued up to 3800 at tip of Ridge.
rotundifolium	266		
sp?	48		
sp?	1	2650 – 2900	
–	0	2100 – 2300	
–	0	2100 – 2400	
–	0	2900	
–	0	2100 – 2500	
–	0	2000 – 2200	
–	0	2500 – 3000	
sp. not given	14	3400 – 3659	These might also be known as Skulls Gap Areas.
rotundifolium	3	3400 – 3659	
glandulosum	14		
	397		
–	0	2500 – 3000	
–	0	2800 – 3200	
–	0	2700 – 3000	
–	0	2800 – 3200	

Data from maps and Pine Data Sheets prepared by W. H. Robens, Blister Rust Checker, 1933

Summarized & Compiled by Roy G. Pierce,
2/17/34

Ribes Distribution on the Unaka National Forest in Virginia

From the preceding table it appears that Ribes were only found in abundance in two areas where white pine represents over 5% of the stand, viz.:- East Fork of Dry Run and at Skulls Gap. Two species, Ribes rotundifolium and Ribes cynosbati were found at the former place in Unit 27 of New River, W.C. with the former predominant, and Ribes glandulosum and Ribes rotundifolium at the latter place.

Below elevations of 2500 feet Ribes are practically absent within the Forest; between elevations of 2500 and 3000 feet, Ribes are frequently absent, only 1 out of 4 areas being found with Ribes. As the elevation increases Ribes become more abundant.

A list of other locations within the Forest boundary where Ribes are known, is here given: -

Comers Rock - -	Grayson - Wythe Counties -	elevation	4113 feet.
Mt. Wilson - -	Grayson - Smyth " -	"	5719 "
White Top Mt. -	" " " -	"	5520 "
Sugar Grove - -	Smyth County -	"	2600 "
Konnarock C C C Camp -	Washington County -	"	2900 "
Horse Heaven- -	Wythe County		
Pool Spring Branch of Dry Run -	Wythe County		
Jackson Branch north of Horse Heaven -	Wythe County		

The white pine at these eight places was either absent or too scarce to merit Ribes eradication.

Ribes Distribution in Tennessee

Too few areas have been scouted on the Forest in Tennessee as yet to draw any conclusions. Scouts from Camp F - 7 Virginia, scouted four areas in Johnson County, Tennessee between 2500 and 3200 feet elevation, finding no Ribes. K. D. Henze and Roy G. Pierce scouted on the planting sites of Clear Fork Unit on Unaka Mountain, about 4000 feet, and on Laurel Fork at 3500 feet; also at the Foot of the Mountain Camp up Jacobs Creek. Good white pine was seen three miles below the Camp and one mile below the Camp - , but no Ribes.

Future Work

At least four areas in the New River Working Circle were given a quick reconnaissance and found with sufficient white pine to justify more intensive scouting, viz:-

Unit 2 on Powder Mill Creek.
Unit 9 on Yellow Branch of Brush Creek.
Unit 10 on Main Branch of Lick Creek. - 200 acres.
Unit 33 on Granny Creek -. 543 acres to work.

No data is available as to the extent of the Forest not covered.

Mr. Robens has suggested that Unit 95, at Skulls Gap, be rescouted in the spring of 1934 on account of the difficulty of getting out all the roots of the skunk currant. He writes, "The 14 R. glandulosum were average sized with many spreading roots and numerous separate shoots arising from each root system". These 14 bushes might be considered the equivalent of several hundred skunk currants as they are generally counted elsewhere. Each handful of stem and roots pulled is usually counted separately as one bush, rather than the large many-branched, many-rooted skunk currant patch being counted as one bush.

Recommendation

It would seem desirable to include in future blister rust reconnaissance, some areas which do not fall in the classification of having 5% or more white pine; or even areas having 5% or more white pine below 10 acres. Such marginal pine areas may, with assistance and protection, become good pine areas. Their location should be known and shown on a small scale map. (There is no need , at present, of a detailed map showing these areas.) Some data might be gathered, and recorded on a data sheet, as to number of pines per acre, size of trees, etc. Periodically, say once in 10 years, these marginal pine areas might be rescouted for Ribes. If their general location is secured in the first survey, this would make it easy to locate them at any future time. In the future, their rating may be better.

The Shenandoah National Park

Blister Rust Control Work has been carried on in the proposed Shenandoah National Park for the period June 1 to December 31, 1933. Previous to this year preliminary surveys had been carried on by Messrs. C. R. Willey and R. G. Pierce in 1932, along Skyline Drive for 15 miles south from Thornton Gap, and along the western base from Stony Man to Front Royal. The blister rust had also been located at Thornton Gap in the Fall of 1931 by Messrs. Geiser and Hodgkins.

Mr. E. H. Francis has been carrying on the work this year and has so organized it that not only has the whole area from Thornton Gap to Bootens Gap been scouted for white pine, but that three of the most important areas along Skyline Drive, including Head of Hawksbill, Sexton Cabin, and Skyland have been protected from the rust. The work this year may be summarized as follows:

Three areas with gross areas of 760.3 acres containing 164 acres of pine were worked by from six to fifty men, 243,240 Ribes being pulled. The bushes on these areas, which range in elevation from 3300 to 3700 feet, averaged from 130 to 504 to the acre. 1785 man-days of labor were spent on the eradication work, while 506.5 days were spent in supervision, checking, mapping and marking lines.

In addition to the three areas where crews were used to remove the Ribes, 2578 acres of pine were found free of Ribes. 985 acres were medium density pine (from 20 to 60 trees per acre) and 1593 acres were of scattering growth (less than 20 pine per acre). In the whole central section of the Park, Francis reports, "31,329 acres were scouted, of this 9519 acres

of pine were mapped. 1811 acres have a medium density, of between 20 and 60 trees per acre, and 50 acres have a heavy denisty of over 60 trees per acre."

Work Now Being Carried On

This winter, in fact since November 1, additional scouting is being carried on over several sections of the Park, in the north end near Front Royal and at the south end near Grottoes.

Future Work

Mr. Francis has already made plans for working about 3500 acres this coming summer.

Blister Rust

The first pine infection in Virginia was found by Mr. Francis or his men on August 3 on the southeastern slope of Hawksbill Mt.; later infections were found on rotundifolium in this locality as well as on several Ribes rotundifolium in Sexton Cabin Area. Mr. R. A. Sheals located the rust on Ribes along the Lee Highway less than a half mile west of Thornton Gap, while Mr. Clyde Stevens located the rust on Ribes rotundifolium on the west slope of Pignut Mt. about 10 miles northwest of Sperryville. This is either inside the proposed Park area or close to it. The infections in the Park were found in Page, Madison, and Rappahannock Counties.

Ribes Conditions

Ribes are much more numerous at higher elevations than at lower ones, and the work of this past summer being confined to three areas along Skyline Drive, it took more time and cost more than similar work in the valleys outside of the Park area or areas at lower elevations within the Park boundary. Ribes are not found everywhere in the Park, for Mr. Francis and his men located 2578 acres of pine bearing no Ribes.

Tabular Summary of Ribes Eradication Work, Shenandoah National Park Areas

Name of Area	Kind of Work	Acreage White Pine	Acreage White Pine & Protective Zone	Number Ribes Bushes Pulled		
				Total	Per Acre Worked	Per Man Days Labor
1. Head of Hawksbill	Initial	85.0		162,968		
2. Sexton Cabin	"	52.7	760.3	46,585	320	136
3. Skyland Resort	"	26.3		33,687		
Totals		164.0	760.3	243,240	320	136

Number of Work Days

Name of Area	Labor on Crew Work	Forestry Foreman Francis	Checkers Foreman Dept. Agri. Scout	Office Work Mapping	Surveying & Marking Protective Zone Lines	Total- All Classes of Work
1. Head of Hawksbill 2. Sexton Cabin 3. Skyland Resort	1785.	122	272.5	6	106	2291.5

Pine Areas in Proposed Shenandoah National Park
Surveyed up to November 1, 1933

Location	Areas found with Ribes*	Areas in which no Ribes were found by advance scout.	
		White Pine Over 20 per acre	White Pine Under 20 per acre
	No. acres	No. acres	No. acres.
Black Rock	376.0	83.0	
Buck & Beech Spring Hollow	94.4		57.6
Bush Mt. Bootens Gap		316.0	
Bushy Top Mt.	52.4		
Corbin Mt.			106.0
Dark Hollow	58.0		
Elder Ridge			128.8
Gravel Ridge	12.4	114.6	176.8
Hawksbill	178.0		
Haywood Mt.	1045.0		
Hazel Top Mt.	52.0		
Kettle Canyon	407.2		
Long Ridge	60.0	24.0	107.0
Marys Rock	496.0	125.6	
Mill Prong	530.0	488.0	
Oven Top Mt.	372.0	163.2	
Panorama Mt.	11.2	78.4	
Pinnacle, The	122.0	73.2	
Robertson Mt.	14.4	4.4	188.4
Rose River	563.0		
Skyland	493.2		
Stony Man	869.6		
W. Hollow	87.2		90.8
White Oak Canyon		123.0	
White Rock Mt.			129.3
Totals.....	5894.0	1593.4	984.7
		2578.1	
Grand total acreage surveyed		8472.1	

* Much of this pine area is in the lowest class, having less than 20 white pines per acre

Cost Data

Eradication Costs		Preeradication Survey Costs Excluding those on Eradication Areas	
Crew Work, Labor	$5372.92	Pine Occurence Mapping & Scouting	$883.45
Checkers & Foremen	1074.24		
Marking Protective Zone Lines	320.57		
Transportation for Crews (up to 10/31)	100.00	Transportation	36.00 *
Office work & Mapping	34.29		
Supervision (E. H. Francis) All of June - Aug. ½(Sept.& Oct.)	568.00	Supervision	213.00 *
Total Costs	$7470.02		$989.09

Cost per acre worked for labor	$7.06
Cost per Ribes bush destroyed, for labor	0.031
Cost per acre worked, for labor, foremen, supervisor, office and transportation	9.82

*Estimates.

MAP OF VIRGINIA SHOWING WHERE BLISTER RUST CONTROL HAS BEEN CARRIED ON.....1928--1933

JAN. 1, 1925

VIRGINIA

SCALE-STATUTE MILES

0 10 20 30 40 50

LEGEND

--Worked from State Camps

--National Forests

--National Park

--Non-pine Area

--White Pine section of State

NORTHAM. ACCOMAC PR. ANNE NORFOLK NANSEMOND ISLE OF W. SOUTHAMPTON SUSSEX GREVILLE BRUNSWICK MECKLENB'G LUNENB'G CHARLOTTE HALIFAX PITTSYLVANIA HENRY PATRICK FRANKLIN FLOYD PULASKI MONTG. GILES CRAIG ALLEGHANY BOTETOURT ROANOKE BEDFORD CAMPB. AMHERST NELSON APPOM. BUCKINGH. FLUVA. CUMBERL'D PR. EDW. AMEL. NOTTO. DINWIDDIE CHESTF'D POW. GOOCHL'D HENRICO CH. C. PR. GEO. JAMES C. CITY JAMES R. KING & Q. K. WM. NEW KENT KING GEO. CAROLINE HANOVER SPOTSYL. ORANGE LOUISA ALBEMARLE GREENE MADI. PAGE WARR. PRINCE WILLIAM FAIRFAX FAUQUIER CULPR. CLARKE FREDK. LOUDOUN SHENANDOAH ROCKINGHAM AUGUSTA ROCKBRIDGE BATH HIGHLAND BUCHANAN TAZEWELL RUSSELL DICK. WISE LEE SMYTH WASHINGTON SCOTT WYTHE GRAYSON BALTIMORE

GOVERNMENT PRINTING OFFICE

LOCATION OF BLACK CURRANTS IN VIRGINIA

(Based on card records, Division of Blister Rust Control, 1916-1921 Inc.)

JAN. 1, 1925

VIRGINIA

SCALE-STATUTE MILES

0 10 20 30 40 50

ACCOMAC · NORTHAM. · PR. ANNE · NORFOLK · NANSEMOND · ISLE OF W. · SURRY · SUSSEX · SOUTHAMPTON · GREENSVILLE · BRUNSWICK · MECKLENBG · LUNENBG · CHARLOTTE · NAELIFAX · PITTSYLVANIA · HENRY · PATRICK · FRANKLIN · FLOYD · CARROLL · GRAYSON · WASHINGTON · SMYTH · WYTHE · BLAND · TAZEWELL · PULASKI · MONTG. · GILES · CRAIG · ROANOKE · BOTETOURT · ROCKBRIDGE · BEDFORD · AMHERST · CAMPB. · APPOM. · PR. EDW. · CUMBERLD · PRINCE EDW. · FLUVA. · BUCHAN. · DICK. · RUSSELL · LEE · SCOTT · WISE · ALLEGHANY · BATH · HIGHLAND · AUGUSTA · ROCKINGHAM · SHENANDOAH · PAGE · WARR. · FRED'K · CLAR. · LOUDOUN · FAIRFAX · PR. WILLIAM · FAUQUIER · STAF. · SPOTSYL. · ORANGE · CULP. · RAPP. · GREEN · MAD. · ALBEMARLE · LOUISA · GOOCHL'D · POW. · CHESTD. · HANOVER · CAROLINE · K. GEO. · K. & Q. · K. WM. · NEW KENT · CH. C. · HENRICO · DINWIDDIE · MOTTO. · NANS. · ESSEX · MID. · GLOU. · MATH. · WESTM. · RICHD. · L. W. · JAMES CITY · YORK · ELIZ. CITY · WARWICK · NORFOLK · PR. GEO.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150

40° 39° 38° 37° 36° 83° 82° 81° 80° 79° 78° 77° 76°

GOVERNMENT PRINTING OFFICE

SUMMARY OF ERADICATION WORK IN VIRGINIA IN 1933.
(Including Initial and Reworked Areas)

	National Forests	National Parks	Total Federal lands	State and private	Grand Total
Acreage pine protected	-	-	-	-	5,406
Acreage worked	10,681	3,958	14,639	8,129	22,768
No. Ribes pulled	12,693	243,240	255,933	6,112	262,045
Man days supervision and labor	620	2,172	2,792	119	2,911
Cost of control	$1,225.36	$7,656.02	$8881.38	$392.20	$9,273.58
Cost per acre	0.115	1.93	0.667	0.048	0.407
Ribes per acre	1.2	61.5	17.5	0.75	11.5
Acres worked per man day of labor and supervision	17.2	1.8	5.2	68.3	7.8

	Initial Work	Reworking
Acres worked - - - - - - - - -	20,232	2,536
Ribes pulled - - - - - - - - - -	253,172	8,873
Cost, total - - - - - - - - - -	$8,937.53	$336.05
Cost per acre - - - - - - - - -	0.441	0.132
Ribes per acre - - - - - - - - -	12.5	3.5

WEST VIRGINIA ANNUAL REPORT

BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS

Foreword.

Scouting for the blister rust began in West Virginia in 1917 and was continued in 1918 and 1919. Prior to this in December 1915 the West Virginia Department of Agriculture at Charleston had issued Bulletin No. 12 "The Chestnut Blight and the White Pine Blister Rust" written by A. B. Brooks. Mr. Brooks called attention to the presence of the blister rust in the County and warned the residents of West Virginia of the damage that might be done by the disease, and the methods of controlling it.

In recent years scouting for the rust was resumed in 1928 when Geiser and Pierce covered the northern counties from Jefferson County to Wetzel County. Scouting was continued each year by a party of two or three men from the Division of Blister Rust Control at Washington up to and including 1932. In 1931 the rust was first found in the State by Messrs. C. T. Geiser and L. W. Hodgkins.

Policy.

The State has made $125.00 available for work in the fiscal year ending June 30, 1934 while the Federal Government has allotted $1,000.00 for the work during that period.

Cooperative work in the State began July 1, 1932. It is being carried on by the United States Department of Agriculture through its Division of Plant Disease Eradication and Control in cooperation with the West Virginia Conservation Commission and the West Virginia Department of Agriculture.

Distribution of White Pine.

As pointed out by Cope in 1930 there are three main white pine sections:- 1. Raleigh, Summers, and Mercer County in the South. 2. Pocahontas and Greenbrier Counties and 3. Pendleton County. Tucker County which formerly had considerable white pine has been largely cut out. Cope estimated white pine acreage in the State (when white pine represented 5% or more of the stand) at 149,000 acres distributed as follows:

Grant County	2,000 acres	Pendelton County	80,000 acres
Greenbrier "	4,000 acres	Pocahontas "	25,000 acres
Hardy County	1,000 acres	Raleigh "	20,000 acres
Mercer "	12,000 acres	Summers "	3,000 acres
		Monroe County	2,000 acres

There are small acreages in white pine in Berkeley, Hampshire, Morgan, Preston, Randolph, and Tucker Counties. Scattered native white pine were also noted by A. K. Perry in 1918 in Calhoun, Hancock, Mineral, Morgan, and Ritchie Counties but they are of relatively small importance.

Ownership of White Pine.

Of this area of 149,000 acres it was estimated January 1, 1933 that there were 21,823 acres or 14.68% of the total in National Forests. Within the year the GeorgeWashington Forest has aquired or has under option about 8,000 acres of land in Pendleton County which drains into the Moorefield River. The amount of white pine in this area has not yet been determined. The Monongahela National Forest has also enlarged its boundary to the south to include the fine white pine region of Pocahontas and Greenbrier Counties east of the Greenbrier River. This area is still in private ownership but a considerable portion will, I believe, be purchased by the Federal Government.

The State of West Virginia has two State Forests - the Seneca and Watoga both in Pocahontas County but the acreage with white pine is quite small probably not exceeding 200 acres.

Stand of White Pine.

According to United States Forest Service statistics there are 22 million feet of white pine saw timber and 177,000 cords of white pine on cordwood areas in the State valued at $460,670.00. The Federally-owned stumpage January 1, 1932 was estimated at 3,230,000 feet of saw timber valued at $22,158.00. This has been augmented by purchases.

White Pine Plantations.

A list of the white pine shipped from the Conley State Forest Nursery at Greenbottom in 1933 was received from Mr. H. W. Shawhan, the State Forester. This list shows that 7,450 white pines were shipped out of which 3,000 went to the Seneca State Forest, Huntersville, the remaining 4,450 trees went to six places in the State. A map shows the location of all plantations made in the past three years.

Distribution of the Blister Rust.

Messrs. C. T. Geiser and L. W. Hodgkins of the Division of Blister Rust Control first found the rust on single bushes of Ribes rotundifolium near Thomas in Tucker County and near Alpena in Randolph County in fall of 1931. Dr. G. W. Martin again discovered the rust in the fall of 1933 near Camp Seneca about 12 miles north of Huntersville in Pocahontas County on private lands adjacent to Seneca State Forest. No other infection was reported during the year from West Virginia, though a number of trained men searched for it in Pendleton and Tucker Counties and several eastern counties.

Distribution of Ribes.

Ribes are found throughout the white pine belt, the chief wild species being the prickly-berried or pasture gooseberry (Ribes cynosbati) and the round-leaf gooseberry (R. rotundifolium). The American black currant (R. americanum) and escaped cultivated red currant (R. sativum) are

also present in the pine section of the State, but not abundantly. The skunk currant (R. glandulosum) is found on the summit of Spruce Knob above the white pine belt, also in Hampshire, Pocahontas and Tucker Counties. Since it is present in abundance in white pine areas in Garrett County, Maryland, at elevations of 2,500 feet and within 3 miles of the West Virginia line, this species may be abundant in some West Virginia pine areas. The Eureopean black currant (R. nigrum) is present in the State, but has not been found abundantly in any section. Although R. cynosbati and rotundifolium are found throughout the white pine belt, they are often localized and tracts of pine occurs which have few or no Ribes, while others contain many bushes.

Concerning the black currants, no special survey for these bushes has ever been carried on. Perry in 1918 wrote "Cultivated black currants are very infrequently found." A small plot of this kind was found at Newell, Hancock County; and a few bushes at each of the following places: Bethany on college campus; Elm Grove at John Dieckman's; Huntington on Ritter Estate; Elkins on H. G. Davis Estate. Aside from these less than a dozen bushes were found growing in county and village gardens here and there.

Nurseries.

The following is a list of nurseries handling white pine, the number of trees being that of January 1, 1933.

Name of Nursery	Number P. strobus	Purpose
State Forest Nursery Greenbottom	41,000	Forestry
John Dickmann & Sons Elm Grove	305	Ornamental
Mt. State Forestry & Nursery Company Gladwyn	Several hundred	Ornamental
Home Nursery Company Fort Gay	100	Ornamental
Gold Nursery Company Mason City	75	Ornamental
Rose Hill Nursery Annamoriah	20	Ornamental

Nursery Sanitation

The only nursery in West Virginia where protective work was carried on in 1933 was the Parsons Nursery on the Monongahela National Forest in Tucker County. Approximately 400,000 white pines are being raised there. A special report on this nursery follows.

Work on State and Private Land in 1933.

Personnel

Dr. G. W. Martin was appointed Blister Rust Checker and acted under the authority of the State Forester, the Division of Blister Rust Control being responsible for technical direction of his work.

Work Accomplished.

Dr. Martin with the assistance of several men from the C.C.C. Camp at Seneca State Forest and one man from Camp Watoga carried on eradication of Ribes (currant and gooseberries) not only during the growing season but even in the dormant season up to January 31, 1934. Dr. Martin estimated acreage covered as follows: Seneca State Forest, 1,975 acres, 13,850 bushes pulled; private lands, 300 acres, 4,000 bushes pulled.

Eradication Work
Carried on from Camp Watoga in 1933 (Data from Pine Area Record Sheets B.R. 77)

Pine Area No.	Location	Area of White Pine	Acres Worked	No. Ribes Pulled *	No. Hrs. Labor	No. Hrs. Super-vision	Total No. Hours Labor & Super-vision	Exact Location of Area	Days Worked
1	Watoga State Forest	8	-	7 cult. gooseberries	8	8	16	Island Lick River near J. Bush place.	Nov. 20
5	" "	?	-	238	4	4	8	Greenbrier River also Rock Run	Dec. 5
13	" "	1	-	-	4	4	8	Old Crouse place	Nov. 20
14	" "	?	-	-	4	4	8	Pyle Mountain	Nov.
15	" "	?	-	97	4	-	4	Slide Hollow. Branch of Island Lick Run	Nov.
Total	on Watoga Forest	9 +	-	342	24	20	44		
2	New River Lumber Co.	?	-	451	36	36	72		Nov.21,23,29
3	" "	?	-	655	28	28	56		Nov.27,28.29
4	Mt. Timber Co	40	-	54	4	4	8		Nov. 24
6	Watoga Land Association	?	-	313	12	12	24		Dec. 5,6
7	Pyle's Place	?	100	530	8	8	8		Dec. 7
8	Marlinton Lumber Co.	?	20	532	4	4	8		Dec. 8
9	Keel Forest	155	-	670	12	12	24		Dec. 11, 12
10	New River Coal Co.	25	-	1006	20	20	40		Dec. 12,13,14
10a	" "	?	-	791	27	27	54	About 4 mi. southwest of Camp Watoga	Dec.15,18,20, 21.
11	Keel Forest (mostly)	50	-	350	4	4	8	Along Laurel Creek for 3 miles	Dec. 15
12	Watoga Land Association	100	-	2979	72	72	144	Beginning where Beaver Creek crosses public road and working east	Jan. 2-15
Total	Private Land	370 +	120	8331	227	227	454		
Grand	Total	379***	120	8673**	251	247	498		

* Data from Pine Record Sheets of Dr. G. W. Martin.

** This does not agree with Weekly Summary by Dr. Martin which gives a total of 5592.

*** Weekly Summary by Dr. Martin gives 405 acres of pine cleared of Ribes and 770 acres of pine with no Ribes found; total of 1175 acres worked or scouted.

Eradication Work Carried on from Camp Seneca in 1933

(Data from pine area record sheets B.R. 77)

Pine Area No.	Location	Area of White Pine (Acres)	No. Ribes Pulled	No. Hrs. Labor	No. Hrs. Super-vision	Total No. Hours Labor & Super-vision	Exact Location of Area	Days Worked
1	Seneca St.For.	20	515	68	16	84	Immediate vicinity of Camp Seneca	Sept. 12,13
2	" " "	100 +	4892	132	40	172	Seven Mile Creek on Blackberry Ridge.	Sept. 14,15, 18,19,20.
3	" " "	50 +	1071	32	8	40	From Co. Road along telephone line to Fire Tower	Sept. 21
7	" " "	?	3050	88	24	112	Michael Mt. to East Crest	Sept. 27,28, 29.
8	" " "	?	1005	52	16	68	Foothills of Michael Mt. involving 8 ravines	Sept.16,17
9	" " "	40	1600	100	48	148	From Ray Farm to to Perry Farm extending East 40 rods	Oct. 2,3,4,9, 10,11
14	" " "	200	125	12	4	16	Opposite Michael Mt. in South along Hively's line fence	Oct.24,25
Total	Seneca St.Forest	411	12,258	484	156	640		
4	Maggie Perry's Farm	80	460	128	32	160		Sept. 22,25
5	H.G.Schrader's Farm	23	1200	80	40	120		Oct. 12,13
6	Fred Fertig Farm	40	300	32	8	40		Sept. 26
10	Wm. Gregg's Farm	25	75	24	8	32		Oct.18,19,20
11	Palen Gregg's Farm	50	400	12	4	16		Oct. 24,25
12	Walter Hively's Farm	?	50	12	4	16		Oct. 24,25
13	Jno. Hively's Farm	10	400	24	8	32		Oct. 24,25
Total Private Land		228	2885	312	104	416		
Grand Total		639+(1)	15,143	796(2)	260	1056		

Remarks:

(1) Weekly Summary B.R. 77 for Nov. 4 shows 475 acres of pine cleared of Ribes and approximately 2,000 acres of pine land scouted upon which no Ribes were found. Also shows 14,273 Ribes pulled.

(2) 56 hours of labor, additional, used probably in scouting on lands where no Ribes were eradicated. This makes a total of 852 hours of labor used, at 8 hrs. per day, at Seneca Camp.

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Summary of Work at Camps Seneca and Watoga.

(Data from Pine Area Record Sheets)

State Land Cleared of Ribes.

Seneca State Forest.....	411	acres	white	pine	-	12,258 Ribes
Watoga State Forest.....	9	"	"	"	-	342 "
Total for both forests.....	420	"	"	"	-	12,600 "

Private Land Cleared of Ribes

Near Seneca State Forest.....	639	acres	white	pine	-	2,885 Ribes
Near Watoga State Forest.....	379	"	"	"	-	8,331 "
Total for private lands.....	1,018	"	"	"	-	11,216 "
Grand total of all eradication done:	1,438	"	"	"	-	23,816 "
Area scouted (No Ribes).....	2,212	acres			-	0 "
Total area covered from two camps...	3,650				-	23,816 "

Number of Ribes per acre of actual area with bushes 16.5

	Hours Worked		Total
State Lands	Labor	Supervision	
Seneca.....	484	156	
Watoga.....	24	20	
Total.....	508	176	684
Private Lands			
Seneca Camp.....	312	104	
Watoga Camp.....	227	227	
Total.....	539	331	870
Grand Total.....	1,047	507	1,554

Man days may be calculated on basis of 8 hours per day. Effective time Martin put in at 7 hours per day at least in September.

Cost Data.

Seneca Camp

Labor - 106½ man days @ $1.00	$106.50
Checker - G. W. Martin to October 31	236.40
Crew transportation	12.00
Total cost	$354.90
Cost per acre (using figure 2,475 acres as scouted, as reported on B.R. 77)	$0.14
Cost per bush (15,143) data from pine record sheets.	0.023

Watoga Camp (including trip to Fayette Co.)

Labor - 56 man days @ $1.00	$56.00
Checker - G. W. Martin Nov. 1, 1933 to Jan.31, 1934.	425.85
Total cost	$481.85
Cost per acre worked in dormant season (using total figure 1,175 acres as reported in B.R.77)	$0.41
Cost per bush (8,673) data from pine record sheets..	0.055

All worked on State and Private lands carried on from Seneca and Watoga Camps.

Labor at $1.00 per day worked	$162.50
Checker - G. W. Martin, salary	662.25
Transportation	12.00
Total cost	$836.75
Cost per acre covered (3,650 acres)	$0.229
Cost per bush pulled (23,816)	0.035

Survey in Fayette County.

In addition to the above work carried on by Dr. Martin a trip was taken by him to Fayette County, West Virginia where he examined about 50 acres including 6 or 7 acres of pine near Cranberry, owned by the New River Company. No rust was found nor were Ribes near. The pines,however, were suffering from some canker, a number of the smaller trees being dead.

Recommendations.

It is recommended that the areas worked near Camp Watoga and from which Ribes were removed in 1933 be checked by Mr. Workman (who assisted

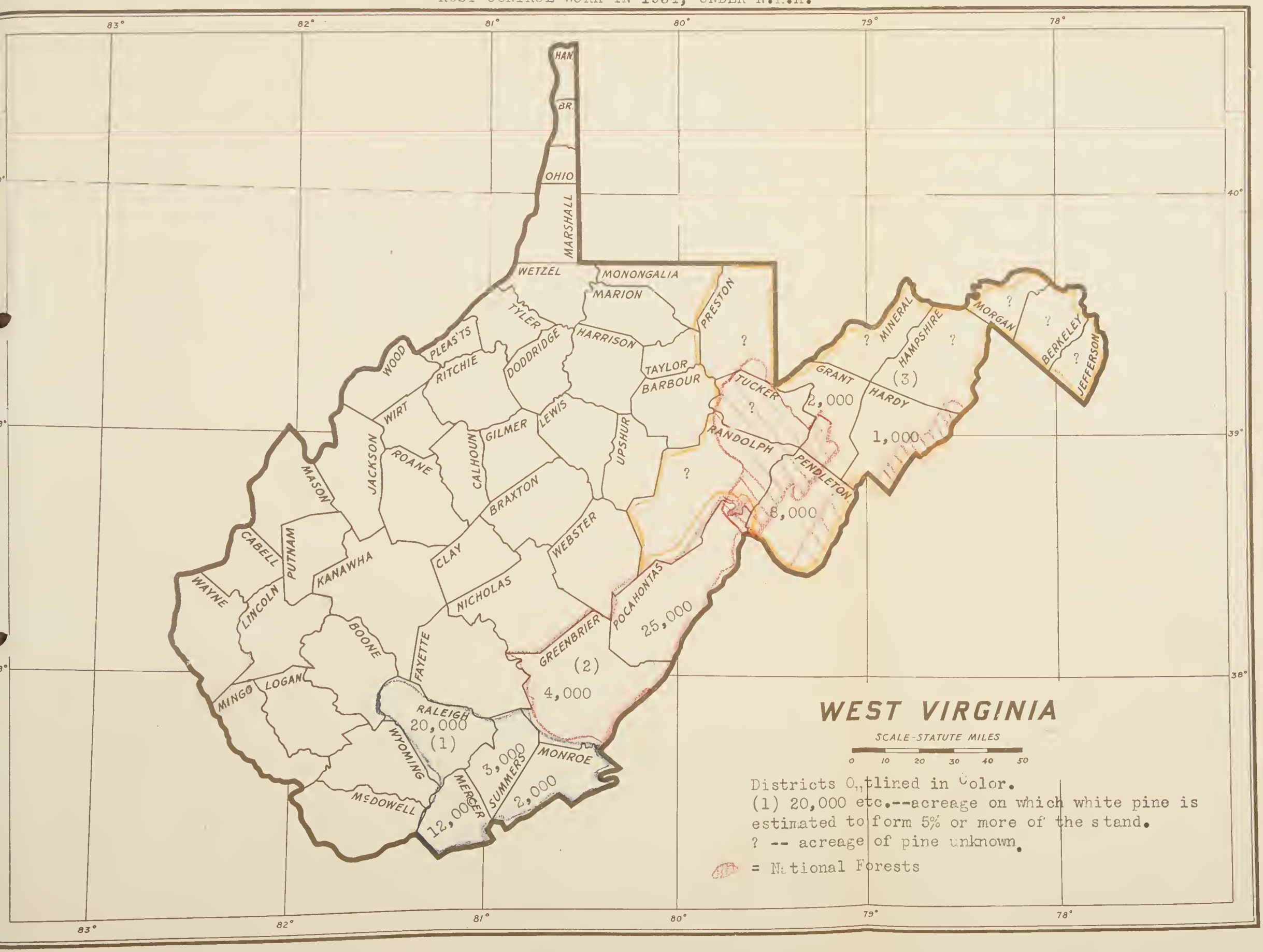
Dr. Martin) early in the spring of 1934 after the leaves have begun to come out, and that record be kept of the number of Ribes found and pulled by him and his assistants for each block worked.

It is also recommended that should any of the blister rust workers find areas this year within close proximity to the Camps - Watoga and Seneca or other camps in the white pine region that they be empowered to call on the camp superintendent for not over five laborers and a strawboss to eradicate these bushes. This distance should be determined after consulting the State Forester and Camp Superintendent.

Work Planned for 1934.

If funds are made available it is planned to carry on a preeradication survey in many of the pine counties and as much eradication work as possible particularly on private land.

SUGGESTED PLAN FOR DISTRICTS IN BLISTER
RUST CONTROL WORK IN 1934, UNDER N.R.A.



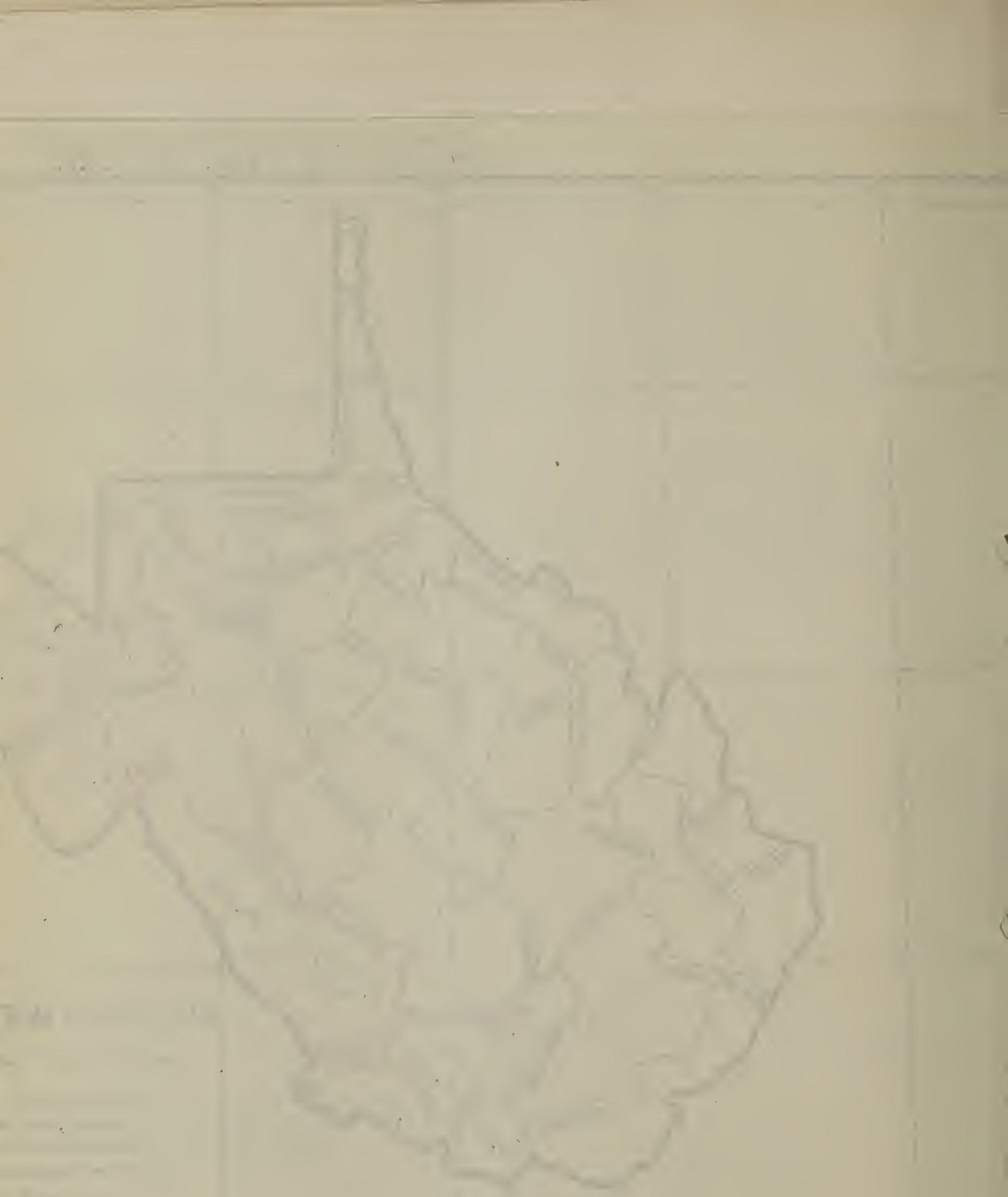
WEST VIRGINIA

SCALE-STATUTE MILES

0 10 20 30 40 50

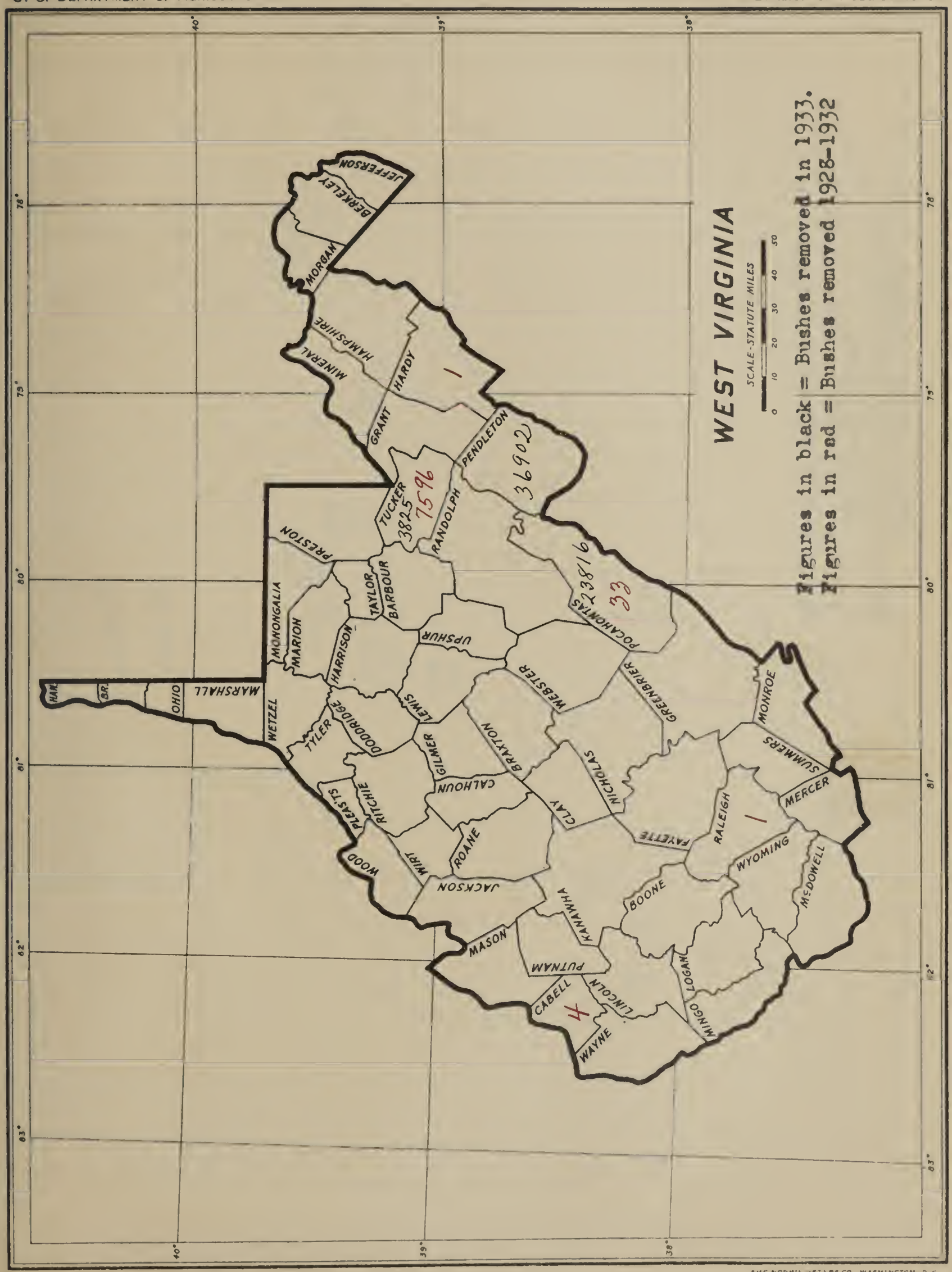
Districts Outlined in Color.
(1) 20,000 etc.--acreage on which white pine is estimated to form 5% or more of the stand.
? -- acreage of pine unknown.
= National Forests

N. 1, 1920



MAP SHOWING RIBES BUSHES REMOVED BY COUNTIES.

U. S. DEPARTMENT OF AGRICULTURE — DIVISION OF PUBLICATIONS

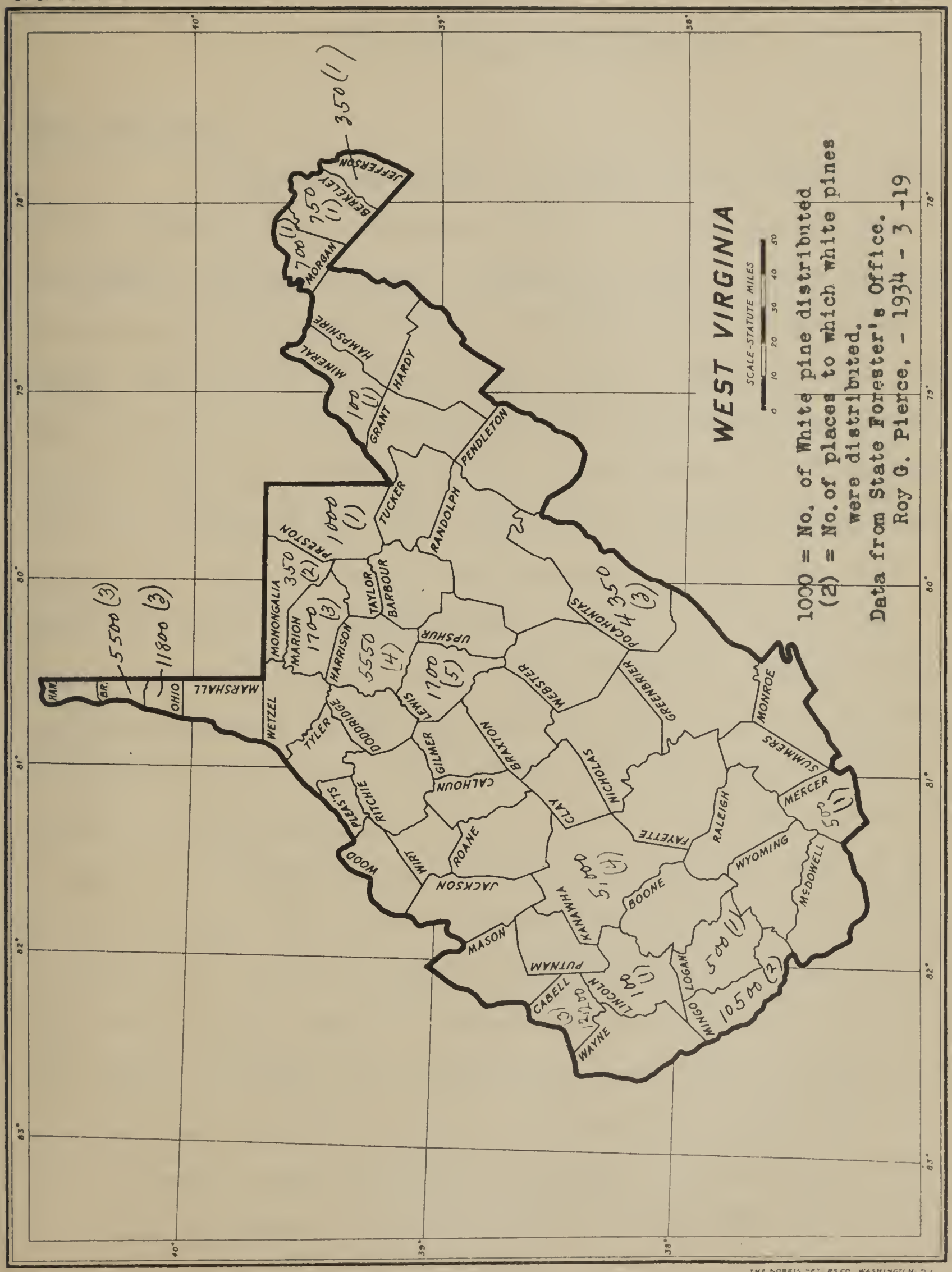


November 1, 1914

THE NORRIS-PETERS CO., WASHINGTON, D. C.

WHITE PINE DISTRIBUTION FROM STATE FOREST NURSERIES IN WEST VIRGINIA IN 1931, 1932 and 1933.

U. S. DEPARTMENT OF AGRICULTURE — DIVISION OF PUBLICATIONS



November 1, 1914

THE NORRIS PET. PB CO., WASHINGTON, D.C.

West Virginia

George Washington National Forest

Ribes Eradication

A timber survey carried on by Messrs. Glenn and Sipe in the winter of 1931-32 showed an abundance of Ribes in the Rough Run area near Fort Seybert in Pendelton County. A beginning was made in 1933 in protecting the white pine in one watershed, that of Rough Run proper, 606 acres being worked. The white pine in Rough Run varies from 3 to 20% of the stand. This work was carried on by Mr. G. U. Wolcott, Blister Rust Checker, who worked out of the C.C.C. camp at Fulks Run, Va. The Forest Service established a spike camp at the Rough Run Cabin on August 21 and continued the camp until September 29. There were at all times from Monday to Friday night at this camp 12 C.C. men on the eradication crews, as well as the cook and cook's helper, and part of the time a truck driver. From Saturday morning to Monday morning inclusive, all men were at the main camp in Fulks Run, or traveling between the two camps. The personnel at the spike camp varied from twelve to seventeen laborers (seventeen being used on August 29 and 30). On account of the distance from the main camp, a full day's work could not be secured on Mondays. The number of effective hours for labor varied from 45 to 122 per day. Mr. Wolcott chose two men from the crews as straw bosses. These latter actually managed the crews working on Mr. Wolcott's direction. The majority of laborers were paid $30.00 per month, though for a part of the time there were two $36.00 men, and one $45.00 man on the work. The roads were so bad and so steep that during early summer it took at least two hours to traverse the distance of 12 miles between the camp at Fulks Run and the

spike camp in Rough Run. As the season advanced the road became more passable as it was one of the main projects of the Fulks Run Camp. In 1935 it should not be difficult to travel between the main camp and the various creeks in the Fort Seybert area.

The following table gives the data in eradication in Rough Run, which was all initial work.

Total No. of Man Days			Total No. of Effective Hours		Area Worked in acres		
(1) Supervision	Repts. & Recds.	Labor	(1) Supervision	Labor	White Pine	Total area including prot. zone	Per man-day of labor
27	5 5/8	264	216	1988	175	606	2.29

Number of Ribes Bushes Pulled			Cost of Supervision (2)	
Total	Per acre	Per man-day labor		
36,737 165	60.6	139	$187.00	Reg. crew work Reconnaissance & Checking
36,902	60.9			TOTAL

COSTS

	Labor (3)	Supervision & Labor	Supervision		Labor		Combined Supervision & Labor.	
			Per acre Wh. Bine	Per tot. Acres Worked	Per acre Wh. Pine	Per tot. A. Wrkd	Per acre Wh. Pine	Per to A. Wkd.
Crews & strawbosses at spike camp	$309.00	$496.00	$1.07	$0.31	$1.76	$0.50	$2.83	$0.81
Cook, helper, truck driver at spike cp.	60.70							
Crews and other laborers during rains & at main cp.	213.80							
Includes total cost of above laborers at both camps	$583.50	$770.50			$3.03	$0.96	$4.40	$1.27

(1) Supervision is here used as Forest Service used it to include time of Checker in scouting and eradication, but not time on reports and records.

(2) Total salary for period August 21 to September 29 inclusive is considered cost of supervision (calculated at $141.95 per month).

(3) This item of $309 includes only laborers and stawbosses on the two eradication crews while at spike camp. The cost of crew labor together with cook, helper and truck driver at spike camp amounts to $369.70. The time of all these men while away from spike camp or at camp and during rains is valued at $213.80. Total cost of labor including time at spike camp and main camp amounts to $583.50.

Checking

On September 29, 1933 Roy G. Pierce checked the eradication in Rough Run with the following results:

Table Showing Results of Checks on Rough Run in West Virginia.

No. of Check Plot	Size of Check Plot in Acres	No. of Bushes Pulled by Crews *	No. of Bushes Pulled in Check	Feet of Live Stem	Average feet of Live Stem per acre Found in Check.
No. 1	.125	?	0	0	
" 2	.125	25	1	1.25	
" 3	.185	16	3**	0.42	
" 4	.063	16	1	1.00	
Total	.498	57	5	2.67	5.3

*All Ribes bushes which were hanging in trees or brush on the plot were counted.

**Two were 2" seedlings, the third was a 1" sprout from an old crown which had been imperfectly pulled. It took two hours to check the work on these four plots.

Reconnaissance Surveys and Future Eradication Work

On Sunday, June 18, 1933, Messrs. Wolcott, D. H. Fitzwater, Teder, and Roy G. Pierce made a reconnaissance in Little Rough Run and pulled 30 Ribes on the main stream and up the left fork.

Mr. Wolcott on September 4 writes of the work necessary to be done in this Fort Seybert area as taken from Mr. Sipe's Report.

Rough Run----------750 acres	Ribes are known in these areas.
Little Rough Run-----400 acres	
Fishers Run----------150 acres	
Stony Run---------- 75 acres	
Road Run----------150 acres	

Part of the Rough Run area was finished during September but there is still left a considerable area to work in the upper part of the Run. South of the Fort Seybert area in the newly acquired land and extending southwest clear to the Virginia-West Virginia line, there are numerous creeks known to have white pine which should be scouted during the coming season. Surveying parties have informed me that Ribes are also present in some of the valleys, especially east of Brandywine, W. Va.

There also remains to be worked a small area near Devils Hole Camp on Trout Run, south of Wardensville in Hardy County. This was reported in my 1932 report on page 13. Ribes were found abundantly among the pine at this Camp. This small area should be worked from the nearest C.C.C. camp only a few miles distant.

Roy G. Pierce
January 23, 1934

Report on Ribes Suppression Around Parsons Nursery, Monongahela National Forest.

1933

by Roy G. Pierce.

Introduction

In 1933 the work of "reeradication" was carried on during both spring and fall; the idea being of finding and destroying all of the Ribes in the vicinity of the Parsons Nursery before they "caught" the blister rust and spread it to the white pines in the nursery.

Work Accomplished in 1933

Not only was the area previously worked, gone over this year, both seasons, but the area was enlarged in the fall on the side of Turkey Knob on account of the contemplated increase in the size of the nursery by the spring of 1934. The total number of Ribes pulled this year amounted to 2942 . The acreage worked was increased from 30 acres to 575 acres.

Organization

In the spring I was unable to take direct charge of the eradication work, so the Forest Service secured the services of Mr. Bob Pennington to take charge of the work. He was assisted by two men, who with him covered the entire area. Mr. Sheals checked the work later and found a number of bushes that had been missed. In all, there were 883 Ribes bushes removed in the spring, taking 17 man days and costing $36.72. An analysis of the spring work was made on May 8 from Sheals' map-, this analysis follows. This work seems to have been done too hastily and to have been done by too few men.

In the fall Mr. Donald H. Fitzwater took charge of the work August 18 to September 1; using from 3 to 5 men from the L.C.W. camp at Parsons. He was followed by Bob Pennington on September 4 with from 3 to 5 men, using the same men, largely, that Fitzwater had. The crew quit work on September 22. Pennington continued alone for 3 days in September and 3 days in October. I checked the work of eradication on October 11, with Pennington. Together we found but 20 bushes in Block 7 DFG on Turkey Knob the block which has always been heaviest infested with Ribes, and 3 bushes in Blocks ABCD, west of the cemetary. Mr. Fitzwater's report of September 5 is attached. Of interest was the localities of several patches of cultivated bushes, supposedly within the 1500 foot zone around the enlarged nursery. An airplane photograph of the nursery and surrounding area, received Februrary, 1934, shows that our former maps were in error and that several of these patches of cultivated Ribes which were destroyed lay outside the 1500 foot zone. Their removal will, of course, bring additional safety to the pines.

The following table gives a summary of the work accomplished in 1933 and the cost:

Season	Source of Funds	Initial or Reworked	Average	Number Ribes Destroyed		Total	Man Days			Costs
				Wild	Cultivated		Labor	Supervision	Labor & Supervision	
Spring	Forest Service	Reworked	549	846	37	883	17		17	$36.72
Fall	E.C.W.	Reworked	549	2788	12	3000	130	28	158	222.00*
Fall	Division Blister Rust Control	"	10	47	7	54	3	1	4	14.73
Fall	Division Blister Rust Control	Initial	26	38	50	88		6	6	19.68
			575	3719	106	3825	150	35	185	$293.13

*This includes $92.00 for supervision and $130.00 for labor, the latter calculated on the basis of $1.00 per day for days work performed by the E. C.W. men from the camp, no cost for overhead at the camp having been secured.

RGP:MH
3/22/34.

RIBES ERADICATION AT PARSONS' NURSERY
1928-1933, Incl.

INITIAL ERADICATION

Year	Area Cleared of Ribes	No. Ribes Destroyed		Cost	Per Acre	
		Wild	Cultivated		Cost	Ribes [b]
	(Acres)					
1929	414	3136[a]	75	$91.00	0.219	7.7
1930	52	94	0	2.38	0.046	1.8
1931	68	386	0	3.38	0.049	5.7
1932	15	1821	44	14.29	0.95	124.3
1933	26	38	50	19.68	0.65	3.4
Total	575	5475	169	$130.73	0.227	9.5

Tot 5644

(a) Includes 22 bushes pulled in August 1928 in reconnoissance survey.
(b) Includes both wild and cultivated bushes.

SUBSEQUENT WORKINGS
1930-1933, Incl.

Year	Area Cleared of Ribes	Ribes Removed		Cost	Per Acre	
		Wild	Cultivated		Cost	Ribes [a]
	(Acres)					
1930	300	309	1	$27.37	0.092	1.0
1931	466	963	1	40.00	0.086	2.1
1932	534	762	4	32.51	0.060	1.4
1933 [b]	549	3681 [b]	56 [b]	273.45	0.49	6.7
Total	549	5715	62	$373.83		

(a) Includes both wild and cultivated.
(b) Undoubtedly some of these bushes were pulled in areas not heretofore worked but it is impossible to separate them exactly. These blocks in question ar No. 2 and 41, where boundary was not well defined.

RGP:MH
3/22/34.

SUMMARY OF RIBES ERADICATION 1928 - 1933, INCL.

INCLUDING BOTH INITIAL WORK AND THE REWORKING

Year	1929[a]	1930	1931	1932	1933	Totals
Area in acres, Initial work	414	52	68	15	26	575
Area reworked in acres	0	300	466	534	549	549
Total area worked, in acres	414	352	534	549	575	575
Wild Ribes pulled	3136	403	1349	2583	3719	11190
Cult. " "	75	1	1	48	106	231
Total " "	3211	404	1350	2631	3825	11421
No. Ribes per acre	7.7	1.1	2.5	4.8	6.6	19.8
No. of hrs. for all eradication in year	157	5.8	83	106		
Cost Total						
Cost Per Acre						

SUMMARY SHOWING RIBES ERADICATION IN THE VICINITY OF PARSONS NURSERY, WEST VA., BY BLOCKS 1928-32 and in 1933.

Block No.	Total 1928 - 1932	Total - 1933		Total for period 1928 - 1933 inclusive
		Spring	Fall	
1	21	44	-	65
(1-A	-	-	100	100
(2	2026	131	565	2722
3	32	109	157	298
4	42	7	-	49
5	16	-	7	23
6 A-D	-	-	-	-
7 B	5	6	-	11
7 C E	248	37	24	309
7 D.F.G.	2854	183	1048*	4085
7 H	See #13, merged with it.		-	-
8	-	-	-	-
9	7	-	-	7
10	34	-	1	35
11	0	-	-	-
12	-	-	-	-
7 H & 13	879	-	130	1009
14	14 c	-	-	14 c
14 A	New	-	48	48
15	-	-	2	2
16	31	1	-	32
17 A	15 c	-	-	15 c
17 B	-	-	-	-
18	-	-	-	-
19 A	2 c	-	-	2 c
19 B	119	-	-	119
20	-	-	-	-
21	4	-	-	4
22	21	-	-	21
22 A	New	-	6 c	6 c
23	-	1 c	-	1 c
24	22 c	-	-	22 c
25 A	-	-	-	-
25 B	-	-	-	-
26	49	-	-	-
27	3	8	-	11
28	1	-	5	6
29 A	7	4	-	11
29 B	-	-	-	-
29 C	-	-	-	-
29 D	-	-	-	-
29 E	-	**	**	-
30	-	6	-	6

*494 of these bushes were seedlings.
** 25 Cultivated bushes found not yet removed.

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Block No.	Total 1928 - 1932	Total - 1933 Spring	Total - 1933 Fall	Total for period 1928 - 1933 inclusive
31	-	-	-	-
32	-	-	-	-
32 A	119	-	-	119
32 B	1	-	-	1
32 C	-	-	2	2
32 D	9	-	-	9
32 E	87	8	-	95
32 F	19	6	-	25
33	11	-	-	11
34	(16 (1c	15	-	(31 (1c
35 A-E	20 c	-	5 2 c	(5 (22 c
36	77 1 c	-	4	(81 (1 c
37 A	44 c	-	-	44 c
37 C	-	-	32	32
38 H	303	32	301	636
38 B	8	28	7	43
39, 39 A) 39 B) 39 C)	1	4	5	10
39 D	-	-	60	60
39 E	-	-	-	-
39 F	-	-	-	-
39 G	New	-	7 C	7 C
40 A	14	-	-	14 C
40	12	10 c	8	(20 (10 c
41	252	-	316	468
41 A	148	213	86) 4c)	447) 4C)
41 B	3	5	10c	8) 10 c)
Totals	7598	858	2942	
Total for 1933		3800		
Grand Total, 1928 to 1933				11,398

Analysis of 1933 figures.

In Blocks 2 and 41 many of the bushes were pulled in areas not hitherto worked, that is the block was extended.

In Block DFC almost half of the bushes were seedlings.

The most thorough work is done each year within the 1500 foot zone around the nursery. While the number of Ribes pulled on the whole area of 575 acres, totalling 3825 is large, a much better showing is made within the 1500 foot zone. This zone would eliminate all of Blocks 2, 3, 41, and 41^B and parts 7 DFG, 7 H, 13, 14A. In Blocks wholly outside of 1500 foot zone, 1393 bushes were removed while in blocks partly outside of 1500 foot zone, 1409 bushes were removed. This would leave 1023 bushes pulled wholly within the protective zone: over 402 of these bushes were pulled in the extension of the protective zone to the east. This extension was made necessary by the purchase of additional land for the nursery just east of the present nursery. There were 11 blocks worked this year and previously where no Ribes were located. On the other hand, there were 6 blocks where Ribes were found in which they had never been found before. Of the 74 blocks or subblocks in which the whole eradication area is divided 19 have never been found with any Ribes. This leaves 55 blocks both large and small in which some Ribes have been located. The problem is not one of wild Ribes alone, for cultivated bushes have been found in 19 blocks.

Suggestions for 1934.

The experience of 1932 and 1933 in which work was carried on in spring and fall points to the desirability of continuing this work both seasons. Bushes which are buried under leaves in the spring and which have but little height growth are missed at that season as are bushes which have been grazed closely by cattle the previous year. Such bushes as these, together with two

and three year old seedlings, are caught in the fall work. In the spring if the work is carried on early enough, before other foliage leafs out there is the possibility of locating any large bushes which have been missed because tangled up with other taller vegetation. While there have always been, and probably always will be new bushes found on the north and south slopes of Turkey Knob, and the south bank of the Blackwater River, yet there are practically no blocks in the eradication area that should not be inspected annually, whether Ribes have or have not been found previously.

Recommendations

It is recommended that the Forest Supervisor employ a local man at Parsons, familiar with the control work (either Bob Pennington or his son), and that he head up a crew of 5 men secured from the local C.C.C. camp, just as soon as Ribes leaves begin to appear, and that the entire eradication area as shown by the most recent map (March 15, 1934) be worked for Ribes; also that this work be repeated in the fall probably beginning September 1, concentrating at that time on the area within the 1500 foot zone.

RGP:MH
3/22/34.

NOTES ON RIBES ERADICATION AT PARSONS NURSERY
U. S. FOREST SERVICE, PARSONS, W. VA.

By R. A. Sheals.

May 8, 1933.

The following number of Ribes were located, the first number representing the total number of bushes pulled in each block, and the number of large bushes found, i.e., bushes with more than 2 years growth.

Block No.	Total Bushes	Number Bushes over 2 yrs. old.	No. of Bushes Inside 1500 Ft. Zone	
			Total	No. over 2 years age.
1	44*	6	44	6
2	131	0	0	0
3	109	0	0	0
4	7	0	7	-
7 B	6	4	6	4
7 CE	37	5	37	5
7 DFG	183	10	20	0
16	1	1	1	1
23	1	0	1	
27	8	1	8	1
29 A	4	0	4	-
29 E	25	25	25	25 Not pulled, cultivated.
30	6	0		
32 E	8	0	8	-
34	15	3	15	3
32 F	6			
38 B	28	17	28	17
38 A	32	16	32	16
39 A	4	4	4	4
40	10	0	10	0
41 A	213	187		
41 B	5			
	883	279	250	82
	37 cult			
	846			

*These may be in Block 4 or 5. Others may be in wrong blocks, according to R.A.S.

Analysis of Sheals' figures:

Total bushes pulled April 1933	- 858
" " over 2 years old, Apr. 1933	- 279
No. bushes pulled within 1500 ft. zone	- 250
No. small bushes, i. e., 2 yrs. and under, in 1500 ft. zone	- 168
No. large bushes pulled in 1500 ft. zone, i. e., 2 years and over	- 82

Copied
3/22/34.

REPORT OF ERADICATION WORK AT PARSONS, WEST VIRGINIA, Fall, 1933.

The work of protecting the white pine in the Forest Service Nursery at Parsons began with the arrival of the writer and Mr. Roy G. Pierce on August 16,1933. The area to be eradicated was pointed out to the writer by Mr. Pierce and cultivated gooseberries were discovered at the home of Mr. Ralph Pennington. Eight large bushes were found which would be included in the new protection zone to be formed by the enlargement of the nursery. Arrangements were made to have the bushes removed. Men were supplied by the C.C.C. Camp at Parsons, W. Va., which was under the Supervision of U.S.Forest Service. The crew assigned to blister rust work were men who had never seen gooseberry bushes or who had never been in the woods before this summer. These facts made training the crew an extra difficult task. Also it was impossible to obtain a larger crew due to other details that could not be interrupted in the work of the Forest Service.

A crew composed of three men were taken into the field August 18. To acquaint the men with gooseberries the crew was started in a place (Block 2) where bushes were fairly abundant although the block was beyond the 1500 ft. protection zone. For two days the crew eradicated on Block #2. One man was added to the crew bringing the total to four men and the writer.

The bushes found in Block #2 varied from seedlings to very large bushes. The area had been worked in previous years but bushes evidently had been missed. The bushes were found in the open and very brushy areas. 231 Ribes cynosbati were pulled. When the crew was able to recognize gooseberries, it was moved into the 1500 ft. protection zone.

Work began within the protection zone on Blocks #4 and 5. Area

composed of hardwood thickets and was very difficult to work. Briars and oak were at times nearly impassable. Gooseberries were very scarce. 7 Ribes cynosbati were found.

No bushes were pulled on blocks #6A, 7B. The areas are very heavily brushed and made the going extremely difficult. The C.C.C. crew in spite of being unused to such work worked fairly well.

24 gooseberries were pulled on Blocks #10, 7C and 7E. The majority of the bushes were very small but in a dangerous position with regard to the proximity of the nursery. 47 gooseberries, Ribes cynosbati were pulled on Blocks #7D, F. & G. The area was very brushy. The bushes found were small and fairly plentiful. There were many gooseberries found growing in open pasture which was in a very dangerous position to the nursery.

126 bushes were removed from Block #13. This area was partially pasture and dense hardwood forest. Bushes were found both in open and in dense brush. Work was difficult due to denseness of the underbrush.

No bushes found on Block #6CD. Four Ribes odoratum were removed from the property of Mr. Ralph Pennington. Work was stopped because of a hornet's nest lodged in one of the bushes which had to be burned out. There are 4 remaining bushes.

On Block #15 two Ribes cynosbati were removed by the writer. This block is composed nearly entirely of a very heavy growth of rhododendron also the railroad right of way within the protection zone was scouted and Blocks #32 and 32A by the writer. No bushes were found. Fence lines also yielded no bushes. On Block #36 no bushes were found. Area was pasture and heavy brush growing along the edge of the river.

On the steep slope directly across the nursery on Block #37B the work was very dangerous due to the steepness. The work here went

slowly. 23 Ribes cynosbati were pulled. Several bushes were within 150 feet of the nursery growing in the open at the foot of the slope.

A little slough also in Block #37B was covered. 3 bushes were pulled. This slough should be covered again as it is a natural place for gooseberries to grow and close to the nursery.

The cliffs opposite the nursery in Block #38 B. was covered by means of rope. The cliffs were too steep and dangerous to work without the aid of rope. Work here went very slowly. 31 bushes were removed. Bushes that were found seemed to have sprouted from the crowns of old bushes supposedly supposedly removed in previous eradications.

The eradication work was greatly held up by rain. Approximately 2½ days were lost due to rain. The crew worked on an average of 5½ hours a day on actual eradication. Leaving camp at 8 o'clock in the morning, returning for dinner at 11:30, beginning work at 1 p.m. and quitting at 3:30 p.m. very greatly hampered the progress of the work. The men left camp at 8 a.m. and had to be back in camp at 4 p.m. The men were very sure that this program is followed absolutely. One of the nurserymen, a Mr. Parsons, found one large bush on the nursery flats very close to the nursery itself. This bush was pulled by Mr. Parsons.

25 cultivated gooseberries were found on Mr. Sam Pennington's property in Block 29E. Mr. Oliver, in charge of the nursery, and the writer interviewed Mr. Pennington concerning his bushes. Mr. Pennington will allow the bushes to be removed only on the payment of $10. The matter was placed in the hands of Mr. Roy G. Pierce.

The removal of the cultivated bushes of Mr. Ralph Pennington is in the hands of Mr. Robert Pennington who will have the bushes removed on payment of the sum already agreed upon.

The writer being called to Washington, D. C. on September 1,1933, left the eradication work in charge of Mr. Robert Pennington who will complete the work already started.

D. H. Fitzwater, Agent.

September 5,1933.

Copied: c.j.p.
3/27/34

MAP SHOWING

BLISTER RUST CONTROL

AREA AND ERADICATION WORK — FOREST SERVICE

NURSERY, PARSONS, W. VA.

LEGEND

- BOUNDARY OF CONTROL AREA
- 1500 FT BOUNDARY LINE
- TYPE BOUNDARY
- ROADS AND STREETS
- FENCE LINES
- STONE WALL
- STREAM
- RAILROAD
- PIPE LINE
- RIDGE LINE
- 1 2 3 4 5 BLOCK NUMBER
- (21) RIBES PULLED 1928 - 1933

TURKEY KNOB

NURSERY AREA

BLACKWATER RIVER

SCALE

N

Corrected from aerial photo RGP

DATA COMPILED BY R.G. PIERCE

TRACED BY C.T. GEISER

434 3 15

141

NO. CEN. REGION

Report of

BLISTER RUST CONTROL IN THE NORTH CENTRAL STATES REGION, 1934.

By

H. H. PUTMAN,
Assoc. Pathologist.

Table 1 - White Pine Estimates, October 1,1934.

(Acres White Pine Meeting Minimum Requirements used in North Central States Region)

State	Forest Service White Pine	Forest Service To Work	Indian Service White Pine	Indian Service To Work	State and Private White Pine	State and Private To Work	Total White Pine	Total To Work	Acres Scattered White Pine (Below Minimum Requirements) All Ownership
Michigan	20,000	50,000	---	---	245,370	613,425	265,370	663,425	739,000
Wisconsin	22,175	66,525	28,550	85,650	225,435	676,305	276,160	828,480	239,000
Minnesota	18,400	44,160	5,405	12,972	33,908	81,378	57,713	138,510	950,000
Iowa	---	---	8	70	4,000(1)	29,000	4,008	29,070	1,000
Illinois	---	---	---	---	1,000	2,800	1,000	2,800	1,000
Indiana	---	---	---	---	650	3,900	650	3,900	1,000
Ohio	---	---	---	---	3,300	26,400	3,300	26,400	1,000
Total	60,575	160,685	33,963	98,692	513,663	1,433,208	608,201	1,692,585	1,932,000

(1) Estimated 2,000 acres in native and planted stands and 7,000 white pine shelterbelts with a total estimated acreage of 2,000 acres. It is necessary to make sure no Ribes occur within 900 feet of each shelterbelt, making an average of approximately 50 acres per shelterbelt. However, it is necessary to work only about 3 acres per shelterbelt.

State	Forest Service		Indian Service		State and Private		Total		Acres Scattered White Pine (Below Minimum Requirements)
	White Pine	To York	White Pine	To York	White Pine	To York	White Pine	To York	All Ownership
Michigan	20,000	50,000	---	---	245,370	613,425	265,370	663,425	739,000
Wisconsin	22,175	66,525	24,550	85,650	225,495	675,505	272,220	827,680	279,000
Minnesota	12,400	44,160	5,405	12,972	33,908	81,378	51,713	138,510	950,000
Iowa	---	---	8	70	4,000(1)	29,000	4,008	29,070	1,000
Illinois	---	---	---	---	1,000	2,800	1,000	2,800	1,000
Indiana	---	---	---	---	650	3,900	650	3,900	1,000
Ohio	---	---	---	---	3,300	26,400	3,300	26,400	1,000
Total	60,575	160,685	31,963	98,692	513,663	1,431,208	608,201	1,692,585	1,992,000

(1) Estimated 2,000 acres in native and planted stands and 7,000 white pine shelterbelts with a total estimated acreage of 2,000 acres. It is necessary to make sure no gaps occur within 900 feet of each shelterbelt, making an average of approximately 50 acres per shelterbelt. However, it is necessary to work only about 3 acres per shelterbelt.

Table 2 - Summary of Local Control, Initial Eradication to Protect White Pine Stands, 1933.

Program	Acres Eradicated of Ribes	Number Ribes Destroyed	Total Cost	Total Man-Days	Acres Worked Per Man-Day	Per Acre Ribes	Per Acre Cost
E.C.W.	119,021	7,533,955	70,991.31	31,466.75	3.78	63.3	.59
N.R.A.	4,248	824,780	10,931.85	2,981.00	1.43	194.2	2.57
Other Relief	5,803	404,726	3,385.80	1,490.00	3.89	69.7	.58
Regular	3,059	331,886	1,499.59	588.75	5.19	108.5	.49
Total	132,131	9,095,347	86,808.55	36,526.50	3.62	68.8	.66
White Pine Planting Sites Only							
E.C.W.	1,847	134,897	1,707.98	946.50	1.95	73.0	.93
Grand Total	133,978	9,230,244	88,516.53	37,473.00	3.58	68.9	.66

Table 2 - Summary of Canal Control, Initial Tractication
to Protect White Pine Stands, 1939.

Project	Acres Treated	Number Miles Constructed	Total Cost	Total Man-Days	Average Daily Man-Day	Cost Per Acre	Cost Per Mile
F.C.E.	139,021	7,333,955	10,391.31	31,166.75	7.72	.59	65.3
F.D.A.	4,245	824,760	10,331.35	2,981.00	1.84	2.37	194.2
Other Relief	5,895	404,180	3,385.60	1,490.00	1.89	.58	64.7
Regular	3,059	371,885	1,495.59	586.75	3.19	.49	108.5
Total	132,131	9,095,347	86,406.55	36,596.50	3.65	.66	68.2

Main Line Tractor Ditch Only

C.C.C.	1,547	134,837	1,707.98	596.50	1.95	1.03	173.0
Other Total	131,578	9,250,244	88,316.53	37,473.00	3.58	.65	63.9

Table 3. - Summary of Initial Control Work on Public and Private Lands, North Central States Region - 1918 to 1933.

Ownership Class	Estimated Acreage Good White Pine	Estimated Acreage to be Worked	Acreage Initially Worked 1918-33	% Control Area Initially Worked	Total No. of Ribes Destroyed	Total Cost Eradicating Ribes	Per Acre Cost	Per Acre Ribes
State and Private	513,663	1,433,208	195,026	13.6	11,775,234	127,463.67	0.65	60.4
Fed. For. Service	60,575	160,685	15,306	9.5	939,003	7,719.39	0.50	61.3
Fed. Indian Service	33,963	98,692	21,234	21.5	2,420,057	18,001.06	0.85	114.0
Total	608,201	1,692,585	231,566	13.7	15,134,294	153,184.12	0.66	65.4

Table 3. - Summary of Initial Control Work on Public and Private Lands, North Dakota Brush Eradication Begun - 1915 to 1933.

Operation Class	Acreage Zone Eliminated	Acreage to be Treated	Estimated Total Acres Controlled 1915-33	Area Initially Infested	Total No. of Acres Controlled	Total Cost Treating Sites	Per Acre Cost	Per Acre Sites
Private and Public Service	$13,685	1,637,204	185,094	12.6	11,775,295	$27,585.67	0.85	60.4
Ind.Bur. Service	40,525	150,465	14,304	3.5	694,643	7,719.39	0.50	61.3
Ind. Indian Service	31,985	80,042	21,294	11.5	5,420,057	18,301.06	0.85	118.0
Total	604,271	1,868,691	221,456	13.7	17,134,295	253,184.12	0.86	65.4

BLISTER RUST CONTROL IN THE NORTH CENTRAL STATES REGION, 1933.

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BLISTER RUST CONTROL IN THE NORTH CENTRAL STATES REGION, 1933

GENERAL SUMMARY

During the latter half of the calendar year 1933 the white pine blister rust control program was greatly expanded due to the various emergency relief organizations operating in the Region. Blister rust control was participated in by four programs:

(1) Regular program
(2) National Recovery Administration
(3) Emergency Conservation Work
(4) Civil Works Administration.

The work done under these programs is discussed in this report under the following headings:

(1) Spread of the rust
(2) Pre-eradication survey
(3) Local control
(4) Checking
(5) Nursery sanitation
(6) Cultivated black currant eradication
(7) Investigational activities
(8) Informational work
(9) Costs.

Organization

On July 1, 1933, there was a permanent force of only five men employed for the general organization and supervision of the work. The Regional Director at Milwaukee, a state leader each in Wisconsin and Minnesota, and two district agents in Michigan. On July 3, 1933, three technicians paid from E.C.W. funds through the Bureau of Plant Industry were assigned to the Region to aid in the inspection and supervision of control work done under the E.C.W. program.

Under the N.R.A. program state leaders were appointed in Iowa and Ohio, and memorandums of understanding signed with these two states. In the fall two control districts were established in Wisconsin and three in Minnesota. District agents on N.R.A. funds were employed to handle work in these respective districts. Two assistant agents on N.R.A. funds were hired in Michigan to assist the regular agents in Upper and Lower Michigan. The Milwaukee office force was augmented in December by the addition of an Assistant Regional Director and an Office Manager.

Under the State E.C.W. program 11 checkers were hired in Michigan, seven in Minnesota, and four in Wisconsin to assist the state leaders in giving supervision to control work to be conducted out of state E.C.W. camps.

In Iowa one blister rust checker was employed. In addition there was a force of 18 technical foremen hired to do tree disease survey in Iowa who also did some work in control. In Illinois and Indiana a state checker was employed in each state to determine the extent of white pine and to supervise a limited amount of actual control work. In Ohio one state checker was hired to perform control work out of one state camp.

In the Forest Service S.C.W. camps in Wisconsin, Michigan and Minnesota 18 checkers or technical foremen were employed to give supervision to control work in such camps.

Under the Indian Service S.C.W. program eight checkers and a blister rust foreman were employed to supervise control work done on the Indian Reservations in Wisconsin and Minnesota.

The number of men employed in control work necessarily varied from day to day but the number employed on August 12, 1933, shown in Table 1, is probably representative of the full strength of the S.C.W. organization. It may be seen that on August 12, 1933 control work was done in 68 camps by 1,107 enrolled men supervised by 88 foremen and checkers.

Regular appropriation

The permanent force of five men was carried from January 1, 1933 to August 12, 1933 on the regular appropriation. The Regional Director's salary was on regular appropriation for the full year. His expenses and the salaries and expenses of the other permanent members were paid from C.W.A. funds from August 12 to December 31, 1933.

National Recovery Administration

C.W.A. funds were used to replace the regular federal appropriation in carrying on the cooperative control program as well as for the payment of crew foremen and laborers to perform a limited amount of Ribes eradication in September and October 1933 and pre-eradication surveys the remainder of the year.

Emergency Conservation Work

Ribes eradication was performed under the E.C.W. programs administered by the State Conservation Departments, National Parks Service, U. S. Forest Service and U. S. Indian Service. This work was organized and supervised by the regular control organization. With the exception of one E.C.W. camp of 100 men on the Menominee Indian Reservation in Wisconsin no E.C.W. blister rust control camps were established, but control work was performed as one of the projects in the regular E.C.W. camps. Three technicians were assigned to the region to aid in the inspection and supervision of control work done under the E.C.W. program.

Civil Works Administration

Under the C.W.A. men were employed to make pre-eradication surveys, to perform systematic cultivated black currant eradication and to grub saplings from infected areas. In Table 2 there is shown the number of men employed

Table 1: Personnel on Blister Rust Control Work Under the A.C.W. By Camps on August 12, 1933, North Central States Region.

State	State camps			Forest Service camps			Indian Service camps			Total		
	Camps	Laborers	Foremen and/or wheelers	Camps	Laborers	Foremen and/or checkers	Camps	Laborers	Foremen and/or checkers	Camps	Laborers	Foremen and/or checkers
Wisconsin	15	270	11	3	44	3	1	68	2	17	382	16
Michigan	10	216	10	3	84	6				13	300	16
Minnesota	8	176	12	4	79	5	1	29	2	13	284	19
Iowa	18	360	17							18	360	17
Illinois	1	8	1							1	8	1
Indiana	2	17	1							2	17	1
Ohio	1	24	1							1	24	1
Total	55	1071	53	10	207	14	2	97	4	67	1375	71

in early 1964 under the C.P.A. program. Their work was limited to 75 hours per week at the hourly wage shown in the table. They were required to furnish their own subsistence and car expenses and were required to furnish transportation for himself and his assistants at his own expense. The C.P.A. program in each state was set up as state projects and supervised by the regular control organization. The work will continue in the winter of 1964.

Table 2.- Men Employed on the C.P.A. Program, North Central States in December 1963.

State	Men employed: Foreman	Assistants	Hourly wage: Foreman	Assistants	Duties
Michigan	15	15	1.20	.90	15 crews on white pine blister rust control and eradication. 3 crews rejuvenating chestnut.
Wisconsin	10	30	1.30	.90	Pre-eradication survey
Iowa	10	10	1.30	.90	Pre-eradication survey, white pine deployment
Ohio	4	0	1.20	-	Pre-eradication survey

Control of the Rust

During the course of the work many new infection centers and white pine trees were found, particularly in the Upper Lake States. In these states infection either on pines or fibes has been found in nearly every county working in the white pine region. No infection was found in Iowa, Illinois or Indiana and a few fibes infection points were found in northwestern Ohio.

Pre-eradication Surveys

At the beginning of the 1963 season we were confronted with a lack of information on the location and extent of white pine trees and fibes and the abundance of fibes as this is very necessary to the effective planning of a large scale control program. It was essential to obtain this information particularly within the working radius of C.C.C. camps before fibes eradication could be effectively and economically performed. At the close of the fibes eradication season all efforts were directed to making pre-eradication surveys in the entire region in preparation for the coming field season.

The general method of making pre-eradication surveys consisted in locating and mapping white pine trees and white pine planting sites. During the areas requiring area work and count work and estimating the man-days of

labor required to do the Ribes eradication.

In order to furnish a quantitative basis for judging whether or not a pine stand would justify protection costs minimum requirements as to size of area and number of trees per acre were set up. These requirements were obtained after consultation with many foresters in the region. They are as follows:

	Character of stands	Minimum size area	Minimum stocking for these areas
1	Ornamental pines - Public parks - Resorts	Any size 5 acres	One or more groups 20 pines per acre.
2	Native stands in forest areas	20 acres	1-6 ft. high - 200 pines per acre. 7-15 ft. high - 100 pines per acre. 15 ft. and up - 50-75 pines per acre.
3	Woodlots	5 acres	50 pines per acre.
4	Planted pines	1 acre	500 pines per acre.
5	Shelter belts	Any size	10 or more pines.

In the States of Ohio, Indiana, Illinois and Iowa white pine occurs in scattered areas and usually will not fully meet the above requirements. Therefore, in applying these standards the field men must modify them to meet the white pine values and conditions in these states.

In judging whether or not a given white pine stand should be protected the abundance of Ribes was, of course, taken into consideration. Stands around which Ribes conditions are light can usually be protected by the scouting method at a very small cost. Obviously under these conditions stands not fully meeting the above requirements can economically be given protection. In general, protection costs should not exceed $5.00 to $7.00 per acre of white pine protected or one half a man day per acre for white pine planting sites.

There is apparently a fairly close correlation between forest types and Ribes conditions in the Lake States. In an effort to make use of this knowledge, the following Ribes types have been tentatively established. Each Ribes type is designed to define conditions in which the Ribes abundance is usually of the same degree. In making pre-eradication surveys and in performing actual eradication on such areas Ribes types are indicated by the appropriate letter of the alphabet.

Pine Types

Type	Character	Pine species	Trees
1 Swamp type, under-burnwood, alder, thornapple thick spruce	Water usually standing, deep loams, loose soil, some brush, shrubs, cedar, hardwoods. Little pine scattering. A difficult costly eradication job usually. Very rare, class formation.	P. serotinum P. taeda P. sabaniana P. glandulosum P. cyoosiati P. atyocastheides P. virtellina P. discoriense	None
2 Swamp type, swamp	Water still, deep peat, some grass, leather leaf, some scattered dwarf black spruce. Count as open muck at edges only.	P. glandulosum	Some scrub at edges
3 Upland type, hardwoods with pine	Dry land, rather tuff, easy land to clay loam, good soils. Much hardwood. Black hardwoods with pine, some scrub pine. Good white pine planting sites. Some work.	P. virtellina P. cyoosiati P. taeda P. sabaniana P. glandulosum	Some to fair
4 Upland type, pine	Dry land, sand to sandy loam loams thick peat pine, Norway pine, white pine usually scant work.	P. taeda P. cyoosiati P. virtellina	Some to fair
5 Upland type pasture	Dry land, open rich, pastures. Soils very leathered hardwoods, little pine. Count as open muck.	P. cyoosiati P. virtellina P. sabaniana P. discoriense	Few - seldom often large enough
6 Cultivated	Area in crops or meadow and not woodland open stock work except plow, fences, stone piles, etc	None	None

Standardized legends for showing field work done were established for the Region. Using Eagle Carithin colored pencils, these legends are as follows:

White pine (good stands) - Solid green No. 738

White pine (scattered) - Green diagonals No. 738

White pine shelterbelts - Solid green circle No. 738

White pine planting sites - Solid yellow No. 730

Protection zone limits - Heavy blue line No. 741

Pre-eradication zone limits - Broken blue line

Eradication work completed, zone limits - Solid blue line

Crew work - Brown diagonals No. 746

Pre-eradication crew work - Broken brown diagonals

Crew work completed - Solid brown diagonals

Scout work - Brown zig-zag lines No. 746

Pre-eradication scout work - Broken brown zig-zag lines

Scout work completed - Solid brown, zig-zag lines

Ribes free areas - Left blank

Nurseries producing white pine for reforestation - Solid orange circle No. 737

Pine infection locations - Solid red triangle No. 744

Ribes - only infections - Solid red circle No. 744

Good stand of white pine showing area worked by crew, by scout, Ribes free area, and pine infection.

Table 5.- Acres of White Pine or White Pine Planting, 1938, Cleared and Pre-surveyed Acres Central States Region (CSR).

State	State	E.P.A.	Agency certifying unit: State N.C.W.	F. S. S.C.W.	I. E. S.C.W.	C.W.A.	Private
Michigan	2,513	53,290	139,775	25,064			
Minnesota		11,548	6,613	10,702	7,905		
Wisconsin			43,337	8,275	3,587	21,118	
Iowa			1,088			1,000	
Illinois			967				
Indiana			1,746				
Ohio		406	155			880	

1 The acres shown above do not include acres protected in 1933.
2 794 pine locations (shelterbelts) estimated to average 3/4 acre of white pines each.

In Table 3 is shown the number of acres of white pine or white pine planting sites covered by preconstruction surveys in preparation for control work to be done in 1934.

Local Control

Initial eradication of Ribes was performed in this Region under seven programs; viz., Private Cooperation, State Welfare Relief, W.P.A., State E.C.W., Parks E.C.W., Forest Service E.C.W. and Indian Service E.C.W. The various E.C.W. programs were responsible for performing 51.4 percent of the control work in 1933.

In general, local control was performed as in the past by working Ribes concentrations by means of a five-man crew with a straw boss back of the line. Areas Ribes free, or nearly so, were covered by the scout method; i.e. one or two men zig-zagging over the area looking for Ribes sites. In the individual state reports that follow, exceptions to this general rule are explained. For the first time in this Region string was used to mark crew strip limits and this method proved highly satisfactory. In general, excellent work was done by the C.C.C. boys and, in particular, by the Indian E.C.W. unemployed. In Tables 4 and 5 are shown summaries of control work performed by states and by programs.

It may be noted that a total of 32,500 acres of white pine or white pine planting sites were protected in 1933 by the removal of 2 020 000 Ribes from nearly 138,000 acres. An average of four acres with 60 Ribes per acre was worked per man-day.

The average number of Ribes per acre pulled on regular cooperative control was approximately the same as that done by Indian Service C.C.C. labor, although the latter agency required nearly twice the time to cover an acre as the former. One reason for this difference was that the hours per day worked by crews varied from eight to ten, while the C.C.C. boys averaged six hours per day on the job.

In Table 6 the acres of white pine stands protected are shown by ownership classes in each state. It may be noted that practically 30 percent was privately owned, 28 percent in State forests and 42 percent under Federal ownership.

In Table 7 the acres of white pine stands protected are shown by states and by programs under which the control work was done. It may be noted that over 91 percent was protected under the E.C.W. program and that over 85 percent was protected under the State E.C.W. program alone. By means of private cooperation, that is, the owner furnishing the labor, the smallest amount of control work was performed, only 1.8 percent being protected by owners' labor. In normal times the great majority of white pine stands are protected by the owners themselves furnishing the labor.

In Table 8 the acres of white pine protected in the entire Region have been classified by programs and ownership classes. Since blister rust control was an E.C.W. project authorized on all types of ownership the State E.C.W. program was responsible for protecting over 12,000 acres of privately owned white pine. The small amount of work performed late in the season under the W.P.A. program was largely confined to pine areas under private ownership.

Program	Active cases as of 6/30/[illegible]	Annual admissions	Annual cost	Cost per admission	Cost per case-month	Cost per case-month	Cost per case-month
Foreign nationalities	450	1,214	$54,441	$45	$14.75	$60.37	$1,048.15
Multiple sclerosis	895	1,845	42,550	183	20.00	259.03	376.20
S.S.D.I.	502	2,420	147,570	495	111.70	508.33	2,580.28
Phase I C.D.D.	14,872	63,307	2,181,004	1,218	78.73	4,139.49	71,650.59
Other D.D.D.	370	1,147	32,998	500	180.00	234.27	994.57
S.S.I.- D.D.D.	2,271	7,311	154,095	2,202	93.00	2,136.77	3,197.77
Foreign nationalities	175	126	13,230	58	10.02	50.26	194.29
Phase I.D.I.	693	4,827	676,000	1,000	123.70	1,002.58	2,569.35
Phase II D.D.	2,162	5,000	144,196	4,214	3,000.80	1,726.57	3,998.97
S.S.I.- D.D.D.	1,598	4,070	180,047	[illegible]	7,171.44	988.08	2,011.68
S.S.I.- D.D.I.	1,991	5,000	473,000	1,180	7,771.74	559.98	5,404.08
Welfare relief	581	4,100	$61,788	1,224	7,211.0	203.00	2,399.30
S.S.D.	600	600	600,000	1,000	10,871.75	2,302.10	58,082.78
Phase II D.D.	11,000	58,103	1,847,823	4,000	1,004.00	300.30	2,606.34
S.S.I.- D.D.D.	3,681	2,585	200,481	1,300	121.71	8,471.32	13,000.34
S.S.I.- D.D.I.	7,000	17,647	1,075,291	4,577	2,000.94	464.97	5,974.00
Phase I D.D.	900	535	37,478	7,001	5,138.76	782.31	2,900.07
M.R.A.	500	1,200	54,000	1,000			

1 All DDD eradication.

Table 5.- Summary of Local Control by Programs, North Central Region, 1953.

Program	Acres w.p. or w.o. planting site prepared	Acres cleared of Ribes	Ribes pulled	Man-days: Labor	Man-days: Super-vision	Cost: Labor	Cost: Super-vision	Cost: Total	Per acre worked: Labor man-days	Per acre worked: Cost	Per acre worked: Ribes
Private cooperation	838	5,059	831,888	473	116.75	$1,005.27	$494.32	$1,499.59	0.15	$0.49	205.4
Welfare relief	1,916	5,605	904,778	1,576	116	2,774.90	611.00	3,385.80	.24	.59	69.7
N.Y.A.	1,716	4,240	824,700	2,693	383	9,112.48	1,819.37	10,931.85	.61	2.57	194.5
State S.C.W.	27,054	79,942	9,180,284	16,386.75	1,851.50	34,529.59	8,543.38	42,871.97	.21	.54	69.5
Local S.C.W.	2,612	5,810	867,148	2,334.50	288.50	3,425.40	1,963.94	4,387.34	.41	.76	61.7
F.S.: S.C.D.	7,563	18,825	1,073,600	4,671	654.50	5,754.48	3,060.68	9,117.15	.29	.56	60.7
T.V.A.- S.C.A.	9,807	19,295	2,045,840	8,750	655.50	11,284.25	4,598.61	16,002.66	.28	.98	111.4
Total	50,529	144,776	16,206,241	36,889.25	4,265.25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 6.- Acres of White Pine Stands Protected, by Ownership Classes, North Central States, 1933.

State	Private	Municipal	County	State forests	State parks	Forest Service	Indian service	
Michigan	4,323	715	22	9,765	1,742	4,294		
Minnesota	275			869	2,242	1,588	1,983	
Wisconsin	10,103	64	910	2,398		1,681	7,859	
Iowa	76	15						
Illinois	[1] 125							
Indiana	190			133				
Ohio	589			380				
Total								
Percent	29.9	1.6	1.8	25.9	7.6	14.5	18.7	

[1] all 2nd eradication.

Table 7.- Acres of White Pine Stands Protected, Classified by Agencies Performing Work, North Central States, 1933.

State	Private cooperation	State welfare relief	N.R.A.	State E.C.W.	Parks E.C.W.	F. S. E.C.W.	I. S. E.C.W.	All agencies
Michigan	438	935	552	14,272	370	4,294		
Minnesota	275			869	2,243	1,588	1,983	
Wisconsin		981	504	11,990		1,681	7,859	
Iowa				91				
Illinois	[1] 125							
Indiana				323				
Ohio			680	289				
Total								
Percent	1.6	3.7	3.3	53.2	5.0	14.5	18.7	

[1] All 2nd eradication.

Table 8.- Acres of White Pine Stands Protected, Classified by Program and Ownership Classes, North Central Region, 1938.

Program	Ownership classes: Private	Municipal	County	State forests	State parks	Forest Service	Indian Service	Total	Percent
Private cooperation	838							838	1.3
State welfare	991				915			1,916	2.9
C.C.C.	1,669	29	23	81				1,792	2.7
State C.C.W.	12,805	750	910	13,464	457			27,056	40.2
Farlow C.C.W.					2,612			2,612	3.9
F.S.- C.C.W.						7,663		7,663	11.4
I.S.- C.C.W.							9,807	9,807	14.7
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Percent	29.9	1.6	1.8	26.9	7.6	14.6	18.7	100.0	

Table 9.- Summary of Initial Ribes Eradication, North Central States Region, 1918-1933, inclusive.

State	Acres pine protected		Acres worked		Ribes pulled		Cost		Cost per acre		Ribes per acre	
	1918-1933 inclusive	1933	1918-1933	1933	1918-1933	1933	1918-1933	1933	1918-1933	1933	1918-1933	1933
Michigan	33,026	20,415	89,563	49,572	5,847,169	3,545,352	$41,435.88	$20,680.46	$0.47	$0.41	66.1	70.1
Minnesota	9,148	8,872	25,894	18,511	2,196,417	1,561,881	22,074.36	12,795.81	1.12	.69	84.9	83.7
Wisconsin	44,543	23,015	110,774	59,580	8,041,116	4,025,542	74,014.44	45,850.88	.67	.78	72.6	68.1
Iowa[1]	91	91	1,808	1,808	21,856	21,856	1,416.00	1,416.00	.88	.88	12.8	12.1
Illinois	250		1,966		202,256		1,061.24		.54		102.8	
Indiana[1]	323	323	1,512	1,512	18,308	18,308	656.50	656.50	.43	.43	12.0	12.1
Ohio[1]	969	969	2,104	2,104	71,806	71,806	7,181.68	7,181.68	3.41	3.41	34.0	34.1
Total	88,350	53,685	233,815	131,087	16,418,928	9,244,745	147,839.10	88,580.83	.63	.67	70.2	70.5

Second eradication, 1933.

Michigan	486	981	817	70.40	.08	83.1
Minnesota	50	50	2,489	24.00	.40	54.7
Illinois	125	1,350	7,600	92.20	.07	5.6
Total	661	2,381	10,906	186.60	.08	45.8

1 First eradication work performed in 1933.

In Table 9 is shown a summary of Ribes eradication in this Region performed since 1918. A total of 88,354 acres has been given initial protection by the removal of over 15,000,000 Ribes from 235,413 acres at an average cost of 66¢ per acre worked. Of the total acreage protected 51,683 acres or nearly 60% were protected in 1933. Note that the average cost per acre and the average number of Ribes per acre for the period 1918 to 1933 is almost the same as for 1933.

In Table 10 is shown the approximate status of control work at the close of 1933. It will be noted that the control program has scarcely begun, only 3.6% of the estimated white pine acreage in the Region having been given initial protection.

Table 10.- Status of Control Work, North Central States Region, at End of 1933.

State	Acres white pine (Compiled 1932)	Acres white pine initially protected December 31, 1933	White pine initially protected to date, percent
Michigan	1,027,446	33,026	3.2
Minnesota	1,045,730	9,142	.9
Wisconsin	750,315	44,343	5.9
Iowa	2,400	91	3.8
Illinois	1,600	260	16.3
Indiana	1,700	323	19.0
Ohio	54,900	963	1.8
Total	2,918,091	88,354	3.0

Checking

When the Ribes eradication is completed around a pine stand, the area is systematically stripped by a checker who determines whether or not the work has been effective and has reduced the number of Ribes sufficiently to establish control of the rust and prevent serious damage to the pine.

Check strips 1/5 chain or 13.2 feet wide are run at 10-chain intervals across the area. Ribes are recorded on each strip by species, number of bushes and feet of live stem. When the area is checked by strips 1/5 chain wide and 10 chains apart, a 2 percent check is obtained. If the strips are 5 chains apart, it constitutes a 4 percent check, and if 20 chains apart, a 1 percent check of the area.

Each segment of a strip one chain long and 1/5 chain wide contains 1/50 acre. In computing the results of checking an area on an acreage basis, multiply the number of Ribes found by 50 and divide by the number of chains of strip run. For example, if 5 feet of live stem (F.L.S.) were found on 10 chains of a strip the computations would be: 50 times 5 divided by 10 equals 25 feet of live stem per acre.

As a guide to the checker, a standard of 25 feet of live stem per acre has been set up as the maximum allowable Ribes factor which can safely be left within a white pine stand. It is realized there are so many factors operating for or against protection of stands from blister rust that any figure of Ribes left after eradication we may set up may not fit in all cases. However, if Ribes do not materially exceed the rate of 25 feet of live stem per acre, a high degree of control is obtained and the majority of pine stands will be temporarily protected against serious damage from blister rust. Areas or portions of areas on which the Ribes factor is materially over 25 feet of live stem per acre, should be reworked.

The results of checking are shown in each individual state report. In general, on the great majority of areas worked the Ribes population after eradication was decidedly below the 25 feet of live stem per acre allowed. In only a few cases was it necessary to rework portions of the areas.

Nursery Sanitation

In order to insure white pine planting stock free from blister rust it is necessary that such planting stock be grown in nurseries protected against the disease. This protection consists of removing all Ribes for a distance of 1500 feet from the white pine growing portion of the nursery and cultivated black currants for the distance of a mile.

In 1933 a state nursery policy was drawn up and agreed upon between the State Nursery Inspection Service and the U. S. Bureau of Plant Industry in the following states: Michigan, Minnesota, Wisconsin and Iowa. This policy for Minnesota which is similar to that of the other states is quoted in full herein.

> "In view of the fact that white pine is one of the most important forest trees in Minnesota, and also used quite extensively for ornamental planting and because the destruction of this tree species is threatened by the white pine blister rust, measures are being taken to control this disease.
>
> "As one means of control of the white pine blister rust and as a protection to pine-producing nurseries and to purchasers of white pine ornamental and reforesting stock, it shall be the policy of the various state and federal agencies cooperating in blister rust control work to encourage the establishment and maintenance of Ribes-free sanitation zones around the nurseries in Minnesota producing white pine. A special effort will be made by the State Nursery Inspection

Service and the State Blister Rust Control Organization to secure the cooperation of the nurserymen in the State in order to establish control conditions around the pine-producing nurseries.

"If the amount of white pine produced in a nursery is so small that the owner is unwilling to cooperate in establishing and maintaining Ribes-free zones around his premises, the growing of this species should be abandoned. This class of nursery, together with wholesale and retail dealers, should supply their white pine trade by direct purchase and distribution from protected pine-producing nurseries. Pine purchased for redistribution by nurserymen or dealers whose premises and surroundings are not Ribes-free, should not be held for sale on such premises during the season of the year when rust is spreading from Ribes to pine, viz., from June 30 to October 31, inclusive.

"The State Blister Rust Control organization will cooperate with the State Nursery Inspection Service and the nurserymen in the establishment of such zones and will assume full responsibility for the thoroughness of Ribes eradication.

"Plan of Procedure for Nursery Sanitation Work

"The personnel of the State Nursery Inspection Service and the Blister Rust Control Organization will endeavor at all times to secure the cooperation of pine-producing nurseries in establishing and maintaining sanitation zones. When a nurseryman has expressed a desire to establish such zones, the procedure will be as follows:

"1. Inspection of Ribes conditions (wild and cultivated Ribes, including Ribes nigrum), around nursery by a Blister Rust Agent and a State Nursery Inspector to estimate the amount of work necessary, the probable cost and the feasibility of the project.

"2. Interview nurseryman and securing agreement regarding.
(a) Definite boundary of white pine block.
(b) Boundary of sanitation zones.
(c) Compensation for removal of cultivated Ribes to be paid by nursery.
(d) Control work to be done by labor furnished by nurserymen under the supervision of a Blister Rust Agent.
(e) Initial control work to be rechecked each spring by the Blister Rust Agent.

"3. Blister Rust Agent will map control area and mark boundaries of 1500 ft. zone, at time of initial eradication, and furnish copy together with description of boundaries to the State Nursery Inspector.

"4. Eradication of wild and cultivated Ribes in 1500 ft. zone by crew furnished by nurseryman under supervision of Blister Rust Agent.

"5. Removal of R. nigrum within one mile zone by Blister Rust Agent. Agent to be assisted by a State Nursery Inspector and nursery labor where necessary.

"6. Checking of all completed eradication work by Blister Rust Agent and a State Nursery Inspector.

"7. Inspection by Bureau of Plant Quarantine Inspector accompanied where practicable by the responsible State Nursery and eradication officials or their representatives, if Federal pine shipping permit has been applied for.

"8. Rechecking of control area each spring.
(a) Crew work where necessary under direction of Blister Rust Agent.
(b) Checking of control area by a Blister Rust Agent and a State Nursery Inspector.
(c) Inspection by federal inspector accompanied by a State Nursery Inspector and Blister Rust Agent where practicable.

"9. In accordance with Sections 4, 5 and 6, Chapter 21, Minnesota Laws of 1929, the State Nursery Inspector shall designate a blister rust control areas the areas around pine producing nurseries from which Ribes have been eradicated."

Nursery sanitation in 1933 was performed around federal, state and private nurseries under the various F.C.W. programs and by using nursery labor. In Table 11 is shown a summary of nursery sanitation work performed in 1933. Nursery sanitation work was done at 23 nurseries. To protect 494 acres in the nurseries it was necessary to remove nearly 854,000 Ribes from 7,877 acres.

Black Currant Eradication

The only systematic black currant eradication work in this Region was performed in Michigan. The statement of this work is shown in the Michigan report. During 1933 a total of 216 locations and 1,710 cultivated black currant bushes were destroyed chiefly by men employed under the C.W.A. program in the latter part of December. Since the work started in 1930 there have been destroyed 8,279 locations and 86,158 black currant bushes. Initial cultivated black currant eradication work has now been completed in 20 counties and partly completed in 17 others.

Investigational Activities

Very little work was conducted along investigational lines in 1933. In Wisconsin the chemical eradication experiment established in 1932 was checked in 1933. A systematic disease survey was made on the Lancaster Indian Reservation to determine the rate of spread and intensification of the rust. In Michigan a preliminary study was made of several pine infection centers and a fence was established around one of them to be used as a demonstration plot.

Informational Activities

A considerable amount of information on blister rust was given out through newspapers and other publications. Lectures and motion pictures

Table II.- [illegible] (Cont'd)

Table	Tenant	No. counties	Name areas	Acres surveyed in survey	Value secured or filed	Man-days labor	Man-days winters	Costs labor	Costs Supervision	Costs Total	Forms 1st, 2d, 3d
Jefferson	S.E.C.O.	1	Globe	30	640						
	S.O.P. and S.E.C.O.	2	Texas Consol.	30	640						
Kenmore	Angular	2	Cypress	30	640	1	1,750	225	60	1506.25	1457.50
	S.E.A.	5	Globe	30	373		12,000	787	140.6	921.00	326.52
	S.C.O.	1	Forest Corridor	30	320		42,587	158	55.7	921.30	371.25
							18,010	808	45	496.80	770.30
							11,670	147	20	265.80	165.12
Oakmont	S.C.O.	3	Private	5	320		104,305	969	31	1,989.00	921.00
	S.O.P.	1	Plats	1	160		504	10	1	20.42	5.00
	S.P.C.	1	Sewers Corridor	40	160		144	18	1	36.50	30.40
Iowa	Sup. and S.C.O.		Private								
Indiana	S.C.O.		Oaks								
Ohio	Angular	1	Private	5	160		8,100	8	4.6	27.50	
	S.C.O.	1	Oaks	98	640		134	857	14	715.00	208.38

Includes $70.00 commission for broker.

Table	Forms 1st, 2d, 3d
Jefferson	1st and 2d
	1st
Kenmore	1st and 2d
	1st
	4th.
Oakmont	1st
	3d and 4th
	5th
Iowa	1st
Indiana	1st
Ohio	1st
	1st.

were shown at the various C.C.C. camps explaining the nature of the disease and methods of control. Blister rust demonstrations were set up at a few of the state and county fairs. Several radio talks on blister rust were given under the auspices of the states.

Costs

Milwaukee Office

In Table 12 is shown a summary of expenditures incurred by the Milwaukee office.

Not included in Table 12 is the value of office space provided in the Federal Building and contributed services furnished by the U. S. Forest Service. The U. S. Forest Service has been extremely cooperative in furnishing office space and also a certain amount of office furniture and equipment until we could obtain our own. We have had the advantage of the Forest Service messenger service in distributing and picking up mail. We have had the use of their mimeograph machine and typewriters until we obtained our own office equipment.

With the exception of $245.47 listed under nursery sanitation the total cost of the Milwaukee office was charged to general supervision. The $245.47 item is the amount of expense on W.P.A. funds incurred by J. M. Corliss of the Bureau of Plant Quarantine in nursery sanitation work. His salary was borne by his Bureau.

In Table 13 is shown a summary of all expenditures incurred by the Milwaukee office and the seven cooperating states classified by states and sources of funds. It may be noted that the various E.C.W. programs contributed practically 64 percent of the total funds.

Of the grand total of $168,765.17, 45.3 percent was spent in Wisconsin. Over 85 percent was spent in the three Lake States.

The definitions of the various activities listed are as follows:

Under "Supervision" are listed the costs of state leader activities.

Under "BRC Agent Activities" are listed the costs of supervision in small districts. E.C.W. checkers and the technicians will be listed here as well as those men given general supervision of the work in an assigned group of counties.

Under "Ribes Eradication" are included the costs of labor, crew bosses and foremen who were directly supervising local control activities, transportation, and equipment used in local control.

Under "Nursery Sanitation" are included the costs of labor in performing nursery sanitation as well as the costs of direct supervision of this project.

Table 12.- Summary of Expenditures, Milwaukee Office, 1933.

Funds	Classification	Supervision	Nursery sanitation	Clerical	Express	Freight	Requisitions	Total
Regular appropriation	Salaries	$3,300.00		$360.00				$3,660.00
	Expenses	886.21			$8.21	[1]$316.87	$43.59	1,254.88
	Total	4,186.21		360.00	8.21	316.87	43.59	4,914.88
N.R.A.	Salaries	122.77		147.50				270.27
	Expenses	459.38	[2]$243.47		29.08	2.16	291.14	1,025.23
	Total	582.15	243.47	147.50	29.08	2.16	291.14	1,295.50
F.S.-E.C.W.	Salaries			140.25				140.25
	Expenses							
	Total			140.25				140.25
C.W.A.	Salaries			28.00				28.00
	Expenses							
	Total			28.00				28.00
Total	Salaries	$4,422.77		$675.75				$5,098.52
	Expenses	1,345.59	$243.47		$37.29	[1]$316.87	$334.73	2,277.95
	Total	$5,768.36	$243.47	$675.75	$37.29	$316.87	$334.73	$7,376.47

[1] Includes $305.46. cost of moving Putnam's household effects from Spokane, Wash., to Milwaukee, Wisc.
[2] Expenses of J. M. Corliss on nursery sanitation work. His salary paid by B.P.W.

Table 13.- Summary of all Expenditures, by States and Sources of Funds, North Central States Region 1951.

State	State	Regular E.S.C. appro-priation	S.E.A.	State E.C.W.	Farm E.C.W.	F.S.-E.C.W.	I.S.-E.C.W.	Tech-nicians E.C.W.	C.W.A.	Total	Per-cent
Wisconsin		$4,914.88	$1,295.48			$140.25			$28.30	$6,378.91	
Michigan	$6,690.56	3,755.82	6,615.05	16,003.78	$160.00	4,851.00		$1,727.02	743.65	40,605.83	
Minnesota	103.18	1,210.97	4,270.98	5,760.02	2,329.55	4,022.28	$5,755.17	1,463.68		28,927.03	
Wisconsin	612.65	4,863.47	7,975.87	41,152.81		3,303.73	12,835.49	1,062.77	4,888.51	79,415.58	
Iowa	249.60		460.60	1,302.44	193.00			377.98	1,506.05	4,809.27	
Illinois	91.20			425.00				201.45		717.65	
Indiana	270.00			1,395.75						1,666.75	
Ohio	662.50		7,116.10	3,447.79					280.00	11,474.39	
Total											
Percent	8.3	8.7	16.8	42.1	1.8	7.3	9.8	2.9	4.8		100.7

Under "Cultivated Black Current Eradication" are included the salaries, subsistence expenses and transportation of men engaged in systematic cultivated black currant eradication.

Under "Pre-eradication Surveys" are included the costs of men engaged in making pre-eradication surveys in preparation for future control work.

Under "Checking" are included the costs of performing systematic checking of control work completed.

A certain amount of checking done by the state leader and agents is not included as a checking charge because of the difficulty of segregating such items.

Under "Field Data" are included such items as canker pruning, an item of $60.00, infection studies, etc.

Under "Equipment and Miscellaneous" are included express and freight items, equipment other than that used in local control, supplies from Washington, telephone and telegraph charges, etc.

In segregating charges for the different activities by different agencies, care was taken to segregate the costs furnished by that particular agency only. For example, the amount shown under "Ribes Eradication" opposite "State" or "W.P.A." might have been costs of Ribes eradication performed in conjunction with some of the other agencies, such as the State E.C.W. Under each agency is shown simply that amount of money contributed by that agency on that particular activity. The total costs of the Ribes eradication projects are shown previously in this report. The grand total of the "Ribes Eradication" project in the financial summary will agree with the total Ribes eradication cost in the summary Ribes eradication table.

In Table 14 is shown a summary of total expenditures by projects and states, exclusive of the Milwaukee office. It may be noted that 8.2 percent of the costs were incurred in supervision. Ribes eradication and nursery sanitation accounted for 59 percent. Twenty two percent of the total expenditures were charged to pre-eradication survey in preparation for the next season's work. Of the entire expenditures in the seven states Wisconsin spent 47 percent.

In Table 15 are shown the expenditures in the seven states in the Region exclusive of the Milwaukee office classified by activities and sources of funds.

Two percent columns are shown: One for the seven states exclusive of the Milwaukee office and the other one for the seven states including the Milwaukee office. Exclusive of the Milwaukee office, 8.2 percent of funds were spent on supervision. Since nearly all of the costs of the Milwaukee office were necessarily charged to supervision the percent of total supervision when the Milwaukee office figures are added amounts to 11.5 percent.

Table 14.— Summary of Total Expenditures Classified by States and Activities, North Central States Region, Exclusive of Milwaukee, 1933.

State	Super-vision	D.F.C. agent activ-ities	Rinse eradica-tion	Nursery sanita-tion	Culti-vated black currant eradi-cation	Pre-eradi-cation survey	Checking	Other field data	Equip-ment and miscel-laneous	Total	Per-cent
Michigan	$4,930.79	$3,048.06	$20,659.06	$1,891.57	$1,789.00	$7,156.08	$295.33	$60.00	$775.97	$40,606.86	[illegible]
Minnesota	2,045.89	2,172.03	12,819.61	1,618.31		9,186.74	85.00			28,927.93	[illegible]
Wisconsin	4,179.92	4,413.86	45,890.48	2,523.52		18,247.11	2,830.82		780.29	79,446.50	[illegible]
Iowa	[illegible]		1,413.00	524.60		1,713.49			20.00	4,609.87	[illegible]
Illinois			91.30			626.63				719.93	[illegible]
Outlying	170.00		866.80	116.00		560.23	40.00	74.00	50.00	1,865.73	[illegible]
Total	1,061.31	686.46	7,161.69	949.04		1,270.77	88.24		295.00	11,414.39	[illegible]
Percent	3.2	8.2	56.6	4.6	1.1	23.0	2.1	0.1	1.1		[illegible]

Table 15.- Summary of all expenditures in Region, 1933 (excluding [illegible] Office), Classified by Projects and Sources of Funds.

Source of funds	Super-vision	B.R.C. agent activities	Ribes eradication	Nursery sanitation	Cultivated black currant eradication	[illegible]	Other field data	Equipment and Sundries	Total	Percent (excluding Milwaukee Office)	Percent (including Milwaukee Office)
State	$2,219.57	$1,055.54	$4,141.04	$1,032.23	$729.50	[illegible]		$621.39	$10,364.67	5.6	6.5
Regular D.R.C.	2,793.68	1,320.77	2,451.73	153.14				85.96	9,930.28	5.0	6.7
W.R.A.	1,522.94	2,152.04	10,701.52	251.54	877.77	[illegible]	[illegible]	231.53	27,050.59	15.7	18.8
State S.C.W.	1,927.52	829.05	43,155.46	4,147.54		[illegible]	1,095.76	$74.00	496.70	71,037.57	43.7	42.1
Parks S.C.W.			3,023.55							3,022.55	1.9	1.8
F.S.- S.C.W.	80.00		3,553.22	1,162.39		[illegible]			214.07	12 184.01	7.5	7.3
F.S.- S.C.W.			16,022.55			[illegible]				16,590.56	10.2	9.8
Technicians S.C.C.	677.38	3,475.50	325.13			[illegible]	320.17		.64	4,822.76	3.0	2.9
C.C.A.		84.11			881.65	[illegible]		60.00	274.70	7,174.51	4.4	4.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.0	
Percent (excluding Milwaukee Office)	6.2	6.3	54.5	4.6	1.1	[illegible]	2.1	0.1	1.1			
Percent (including Milwaukee Office	11.5	6.0	52.5	4.5	1.1	[illegible]	2.0	0.1	1.1			100.0

The largest single agency contributing funds was the State E.C.W. agency in the various states which furnished 43.7 percent of the funds spent in the Region, exclusive of the Milwaukee office.

Conclusion

Thanks chiefly to the Emergency Conservation Work program and the National Recovery Administration, we have completed our most successful season of performing blister rust control in the North Central States Region. We have completed the year with a substantial amount of actual control work performed. A considerable amount of pre-eradication survey work was done which will form the basis for efficient planning of an enlarged eradication program in 1934. While we have furnished initial protection to only 3.6 percent of the total estimated white pine in the Region, a good start has been made. The fact is becoming generally recognized that blister rust control is not only worth while, but is also an excellent work relief project because skilled labor is not required and practically no expense is entailed in equipment.

History of the Work

Blister rust work in Michigan started in the summer of 1917 when three or four temporary men were employed scouting for the rust, particularly on imported nursery stock. Infection was first found in 1917 in Oakland County on white pines imported from France.

From 1917 to 1926, inclusive, blister rust work was restricted to a limited amount of scouting for infection on Ribes and pine during the summer months. In 1927 a permanent agent was appointed to take charge of all blister rust work in the state.

In 1928 the first cooperative control project was initiated. The cooperative control money was obtained from a town appropriation and some individual cooperation.

In 1929 the State Legislature established a definite blister rust control law and made available $30,000 for this work during each of the ensuing two years. As a result of the increased money available for the work, an additional permanent agent was appointed during the latter part of 1929 and two more permanent men were added to the force in July, 1930.

In 1932, due to personnel changes and to decreased funds, the permanent blister rust control organization was reduced to two agents.

In 1932 the largest amount of local control work was accomplished due principally to the use of relief labor on control projects. During 1932 a total of 27,281 acres were cleared of 1,172,149 Ribes to furnish protection to 6,384 acres of white pine.

From 1928 to 1932, inclusive, 12,615 acres of white pine were protected by removing 2,663,507 wild Ribes and 2,218 cultivated Ribes from 39,671 acres of initial work and 520 acres surveyed for the second time.

In Michigan the guiding principle in the control program is that cultivated black currant eradication and wild Ribes eradication must go hand in hand. During the period 1928 to 1932, inclusive, cultivated black currant eradication was performed in 24 counties, 19 of which were completed. During this period 2,561 locations and 51,945 cultivated black currant bushes were destroyed. The 19 counties in which the cultivated black currant eradication was completed at the end of 1932 are as follows:

1. Gogebic	6. Menominee	11. Missaukee	15. Presque
2. Baraga	7. Cheboygan	12. Roscommon	17. Oscoda
3. Iron	8. Charlevoix	13. Iosco	18. Mackinac
4. Marquette	9. Benzie	14. Ogema	19. Montcalm
5. Dickinson	10. Grand Traverse	15. Midland	

[illegible] Dept. State work units in divisions and [illegible] to be in charge of Control and Survey Inspection, and the State Director have Control [illegible] Designations of Leading [illegible] to assistant by two full-time agents. John E. Crocker with headquarters [illegible] Agents in Upper Michigan, and [illegible] Thompson, headquartered [illegible] to Lower Michigan. This plan is suggested during the first season to [illegible] field agents can accomplish the preventive work. The supervisory [illegible] duties include the following:

1	Chief Inspector	- State Department of Agriculture
2	Full-time agents	- Bureau of Plant Industry - U.S.D.A.
1	Entomologist	- U.S.D.A. Bureau of Plant Industry
*	Technical assistants	- C.C.C. Forest Service
11	Office work employees	- C.W.A.
*	Diversant Inspectors	- Michigan Department of Agriculture
1	Field agents	- C.W.A.

Labor was obtained from Civilian Conservation Corps, local welfare lists, local work relief on C.W.A. funds, and from [illegible] Labor was supplied by individual plan [illegible].

Control work using county welfare lists and men supplied by individual plan [illegible] was performed to a limited extent in the spring. When the Emergency Conservation Work program was put into effect in May, all efforts were directed toward performing control work. [illegible] it was necessary to obtain an experienced man as possible to give field supervision to the control work within the working radii of C.C.C. camps. [illegible] white pine weevil. Time and effort were spent in properly training and employing these men. The first job in connection with control work in [illegible] from C.C.C. camps was to make pre-eradication surveys and maps of the areas to be worked in 1935. This work was essential in order to make an estimate to the C.C.C. officials of the number of C.C.C. men required to do the work. In general, excellent cooperation was received from the C.C.C. forces.

On August 17, $75,000 was made available for control work to be done in Michigan on F.E.R.A. funds. Owing to unavoidable delays in the establishment of wage rates to be paid, the development of federal employment relief agencies, etc., it was possible to perform only a very limited amount of White pine eradication work in the autumn of 1935 before the White became defoliated making eradication work ineffective. Men employed on F.E.R.A. funds were chiefly engaged in making pre-eradication surveys outside of the working radii of C.C.C. camps in preparation for the 1936 season.

With the inauguration of the Civil Works program (C.W.A.) in December, cultivated black currant eradication was systematically carried up in 11 counties at the suggestion of the state Leader and the approval of the local and state C.W.A. authorities. This work was instituted in 11 counties, each county worked by one C.W.A. foreman and a C.W.A. assistant. The foremen were paid $1.20 per hour and his assistant $0.90

year hour for a 50-hour week. No subsistence was allowed. The foreman used his automobile to transport himself and his assistant at his own expense.

Results of the work done by these various agencies are shown later in this report.

Status of the Rust

In Pine.

In 1916 blister rust was discovered on white pine in Houghton county which being the first of pine infected anywhere in it. The infection was found on a highway plantation in the City of Calumet in the eastern country. These pines were about five years old and had been planted in several rows for a distance of about 80 chains along the road. They became infected from a group of cultivated black currants within 30 feet of one end of the row of pines. The pines were infected throughout the length of the rows with the heaviest infection, of course, close to the cultivated black currants. Infection here apparently originated on the pines in 1911. Nearly 100 percent of the pines were infected in the half of the rows nearer the plants and about 75 percent of them were infected in the further half.

While only one county was added to the list of those in which infection had been found on pines, there was found a marked increase in intensity of infection in other counties previously reported as having pine infection, particularly in Marquette and Dickinson Counties. Several new centers of infection were discovered in Marquette County, the most pronounced being a 10-acre tract with many trees 30 feet high with the upper third killed. In Dickinson County a 17-acre tract of all aged pine was found to have from 75 to 90 percent of the pines infected. Since current leaders, since destroyed, were probably responsible for introducing the disease to these areas.

At the end of 1916 pine infection had been found in the following counties in Upper Michigan:

Marquette	Menominee	Iron
Dickinson	Baraga	Houghton

It had been found in the following counties in Lower Michigan:

Oakland	Montcalm	Iosco
Kent	Osceola	Kent

Generally, infection on pines is more severe in Upper Michigan than in Lower Michigan.

Ribes.

Previous to 1916 infection on ribes had been found in 10 counties, but only Ontonagon and Dickinson Counties in Upper Michigan were added

to this list. In the counties of Houghton and Keweenaw in the copper country cultivated black currant bushes are extremely numerous and, similarly to 1932, nearly all of them were found to be infected in 1933. Infection is extremely heavy on these cultivated black currants -- nearly 100 percent of the bushes and 100 percent of the leaves being found infected in August, 1933.

Blister rust has definitely reached the damage stage, particularly in Upper Michigan in Marquette and Dickinson Counties, and it is only a matter of time until it reaches similar proportions in other counties, unless an intensive control program is carried out. It is safe to say that no unprotected stands of white pine can reach commercial maturity unless the associated Ribes bushes are removed.

White Pine Acreage

According to a compilation from all available sources of white pine acreage in Michigan made in 1932 there was a total of 49,725 acres of good white pine and 20,626 acres of scattered pine. In Lower Michigan there were 338,480 acres of good pine and 627,606 acres of scattered pine, making an estimated total in the entire state of 309,214 acres of good pine and 716,232 acres of scattered pine, or a grand total of 1,027,446 acres of pine. Of this total 34,630 acres were planted.

Pre-eradication Survey

Early in 1933 the two regular agents conducted an extensive white pine inventory in eight Upper Peninsula counties for the purpose of determining the extent of blister rust damage as well as the location and acreage of pine to be protected. The information gathered from this inventory was used as the basis for conducting the 1933 control program.

Into the close of the Ribes eradication season, the supervisory force was retained to make intensive pre-eradication surveys in preparation for the 1934 season. This work was done under funds obtained from the State, W.P.A., M.E.C.W. and Forest Service C.C.W. The results and costs of this work are shown in Tables 16 and 17. In making these pre-eradication surveys the C.C.W. forces were responsible for covering all pine areas within the working radii of C.C.W. camps, averaging about 20 miles, and W.P.A. and State funds were spent covering pine areas outside of these limits. This work will continue in the winter of 1934.

In Table 16 it may be noted that 211,020 acres of white pine planting sites were examined. Particularly on the Hiawatha and Huron National Forests intensive surveys were made of white pine planting sites. There are hundreds of thousands of acres of idle land in Michigan suitable to growing white pine on which there is a minimum of control work necessary due to the general scarcity of Ribes. The results and maps of the pre-eradication survey work on white pine planting sites are turned over to the Forest Officer concerned for his guidance in selecting sites for planting white pines.

Table 10.- Summary of Pre-eradication Surveys, All Agencies, White Pine Stands, Michigan, 1933.

Agency	No. Areas	Acres w. p. to be protected	Acres to be worked by Crew	Scout	Total	Estimated man-days labor required Crew	Scout	Total
State	20	2,519	3,409	4,230	7,639	3,509	69	3,578
N.R.A.	109	9,835	26,637	5,066	31,703	10,850	115	10,965
M.E.C.W.	247	41,429	52,843	54,685	107,528	27,537	894	28,431
F.S.-E.C.W.	28	3,845	7,304	2,613	9,917	4,072	10	4,082
Sub-total	404	57,628	90,193	66,594	156,787	45,968	1,088	47,056
White Pine Planting Sites								
N.R.A.	?	43,455	?	?	43,455	?	?	?
M.E.C.W.	?	148,346	?	?	148,346	?	?	?
F.S.-E.C.W.	?	19,219	3,430	31,704	35,134	1,446	1 0	1,446
Sub-total	?	211,020	?	?	329,935	?	?	?
Total	?	268,648	?	?	486,722	?	?	?

1 No man-days scout shown because scouting work is completed.

Table 11.- Total Costs, Pre-eradication Survey, Michigan, 1933.

Agency	Total cost of pre-survey: State	N.R.A.	M.E.C.W.	F.S.-E.C.W.	E.C.W. technicians	Total	Cost per acre of pre-survey W.p. to be protected	Area to be worked
State	$397.14					$397.14	$0.16	$0.07
N.R.A.	174.42	$1,735.27				1,909.69	1 .19	1 .07
M.E.C.W.	33.52		$3,503.67			3,537.19	1 .08	1 .03
F.S.-E.C.W.				$708.29	$603.77	1,312.06	2 .06	2 .03
Total	604.08	1,735.27	3,503.67	708.29	603.77	7,156.08	.03	.01

1 Based on cost per acre of white pine pre-surveyed. No charge included for cost of mapping in white pine planting sites, since the latter operation was incidental.

2 Based on cost per acre of white pine and white pine planting sites pre-surveyed.

Local Control

Protection of pine against blister rust in the past depended largely upon the cooperation of the individual pine owners who furnished the labor necessary to eradicate the hosts while the state or Federal Government supplied the supervision at no cost to the owner. By 1932 few owners were financially able to stand the expense of protecting their pine. At this point county welfare agencies were prevailed upon to supply welfare labor, it being pointed out that pine stands, regardless of ownership, are an asset to the county as a whole. By 1933 even state or county welfare labor was hard to get because of the general lack of funds.

With the inauguration of the Civilian Conservation Corps a new source of labor became available for combatting the disease. State and Federal blister rust funds were used for hiring experienced supervisors and checkers to direct eradication work. Supervision was also hired on N.I.R.A. funds. Although the work did not get well under way until the middle of the summer, considerable ground was covered before the end of the season. The C.C.C. boys took a general interest in the work and made commendable progress.

C.C.C. camps in Michigan were divided into three groups -- Forest Service Emergency Conservation Work camps (Forest Service E.C.W.), Michigan Emergency Conservation camps (M.E.C.W.), and National Park Emergency Conservation Corps camps (Park E.C.W.). Blister rust control as a project was authorized on lands of all ownership including Federal, state and private in these camps. Control work was performed in all three groups.

Near the end of the eradication season $75,000 was made available by the National Recovery Act (N.I.R.A.) for blister rust control in Michigan. Projects were started and carried on for a few weeks until Ribes defoliation made such work impracticable. Men employed on this appropriation were selected from the lists of the National Reemployment Service. These men proved to be a high grade of labor and very willing workers.

In Tables 13 to 25, inclusive, control work accomplished by these various agencies is shown.

In Table 26 the difference between working conditions in Upper and Lower Michigan may be noted. In Upper Michigan 54 percent of the area worked was covered by crew, with an average of nearly 170 Ribes per acre of crew work. In Lower Michigan only 16 percent of the area worked had to be covered by crew. However, the average number of Ribes per acre of crew work was over double that of Upper Michigan. However, due to the large number of acres of scout work which were nearly Ribes free the cost per acre worked in Lower Michigan averaged $0.34 against $0.56 in Upper Michigan. The number of Ribes per acre of all work in Upper Michigan was nearly 96 as opposed to slightly over 37 in Lower Michigan.

In Table 27 the acres of white pine protected have been classified according to ownership. It may be noted that nearly half of the acreage of white pine protected was in state forests. Approximately one-fifth was in National forests and one-fifth was privately owned

Table 18.- Local Control, Private Cooperation and State Welfare Funds, Michigan 1935.

County	Name of project	Acres w. p. protected	Acres worked			Ribes pulled			Man-days		Costs		
			Crew	Scout	Total	Crew	Scout	Total	Labor	Supervision	Labor	Supervision	Total
Private cooperation													
Charlevoix	Miller Estate	282	383	100	483	54,412	30	54,442	[1] 46	26	$92.00	$119.60	$211.60
Antrim	Porter pine planting	80	223	0	223	229.778	0	229.778	[2] 288	38	[2] 677.00	141.55	818.55
Ionia	Ranney	15	35	105	140	2,033	50	2,083	[3] 6	6	9.00	32.55	41.55
Montcalm	Choate planting	40	95	93	188	8,117	0	8.117	[4] 32	13	41.25	60.45	101.70
Kent	Brown grove	2	40	10	50	10.011	10	10,021	[5] 20	10	25.50	39.97	65.47
Newaygo	Fremont Sc.19	0	160		160	0	0	0	0	1	0	6.85	6.85
State welfare relief													
	No. jobs												
Houghton	1	135	473	0	473	21,130	0	21,130	96	23	138.40	121.37	279.77
Muskegon	1	750	460	638	1,188	21,710	120	21,830	35	52	113.80	177.65	291.45

1 Labor costs based on $2.00 per day.
2 State foreman at school of instruction plus private labor at $2.00 per day.
3 Labor cost at $1.50 per man-day.
4 Labor cost at $1.50 per man-day.
5 Labor cost at $1.25 per man-day.
6 Supervision cost, $191.51 from regular Federal appropriation, $208.86 from state funds.

Table 15.-- Local control, C.W.A. Funds, Michigan, 1933.

County	No. jobs	Acres W. P. project	Labor worked Crew	Labor worked Direct	Labor worked Total	Other outlay From	Other outlay Local	Other outlay Total	Man-days Unskilled	Man-days Supervision	Costs Labor	Costs Supervision
Cass	3	213	297	580	1,177	$9,250	7%	$9,269	130	30	[1]$765.65	[1]$1,0
St. Clair	4	210	299	627	926	$8,181	51%	$8,505	164	[illegible]	[2]$95.55	[2]$139.15
Washtenaw	1	90	150	0	150	$0,760	0	$0,790	42	6	126.00	23.30
Wayne	1	100	212	0	212	$7,216	0	$7,216	114	[illegible]0	159.60	[illegible]67.50
Delta	Unc.	0	20	0	20	$,000	0	$ 000	10	[illegible]0	30.00	[illegible]10.00

1 Includes $725.95 cost of C.W.A. labor and $37.70 cost of transportation, furnished by the state.
2 Entirely on state funds.
3 Includes $580.21 cost of C.W.A. labor and $53.97 cost of transportation, furnished by the state.
Labor based on $0.60 per hour for 30-hour week. Labor representation included in costs of labor.
Supervision covers foremen salaries, subsistence and transportation of supervisors.

Table 20.- Local Control, C.C.C., Michigan, 1935.

County	Camp No.	No. jobs	Acres W. P. protected	Acres worked: Crew	Scout	Total	Ribes pulled: Crew	Scout	Total	Man-days: Labor	Supervision	Costs: Labor	Supervision	Total
Antrim	64-S	1	1	35	0	63	78,531	0	78,531	247	49	$265.39	$165.97	$429.36
Benzie	60-S	2	112	64	411	455	2,365	2	2,365	12	5	12.00	56.65	68.65
Marquette	72-S	4	524	1,130	375	1,505	322,908	0	322,908	503	75	651.75	311.75	963.50
Marquette	67-C	1	100	370	0	370	91,357	0	91,357	242	34	329.74	166.26	496.00
Gr. Traverse	62-S	2	974	106	2,558	2,724	170,471	0	170,471	587	98	715.00	490.70	1,196.30
Gr. Traverse	63-C	3	776	942	1,065	1,267	39,225	21	39,709	244	20	256.00	156.75	390.30
Roscommon	65-S	7	1,456	202	3,355	3,017	140,530	3	140,530	556	65	636.50	506.78	1,143.28
Crawford	52-S	2	2,648	171	5,256	0,427	48,533	0	48,533	106	17	172.46	80.78	253.24
Crawford	60-S	5	194	130	729	859	174,718	60	174,778	503	42	512.00	203.12	715.12
Ogemaw	69-S	3	1,180	183	3,955	3,138	238,420	0	238,420	499	63	538.12	320.00	858.12
Ontonagon	91-S	4	155	399	5	404	212,606	0	212,606	303	16	303.00	196.50	806.50
Otsego	62-S	3	1,184	169	2,129	2,298	105,978	0	105,978	342	44	379.00	207.25	682 15
Delta	90-S	2	300	865	0	365	126,000	0	126,000	380	50	432.21	216.00	648.21
Luce	66-S	3	1,309	198	2,820	3,018	17,200	0	17,200	64	69	100.99	216.60	365.49
Thinkinson	71-S	6	1,740	3,000	550	3,550	154,433	0	154,433	598	82	665.00	837.41	1,502.16
Menominee	67-S	2	515	584	0	984	123,000	0	123,000	231	31	305.54	212.03	602.35
Cheboygan	54-S	7	716	1,037	1,288	2,325	237,363	0	237,363	628	107	1,042.72	465.82	1,490.54
Sub-total		56	14,241	1,858	28,160	36,018	2,350,206	86	2,350,292	6,176	968	7,677.11	4,719.07	12,396.18
Re-eradication														
Gr. Traverse	63-S	1	240	30	370	500	560	0	560	24	4	24.00	31.00	47.00
Gr. Traverse	63-S	1	108	10	371	381	55	0	55	11	2	11.00	12.60	23.60
Sub-total		2	348	40	741	881	615	0	615	35	6	35.00	43.60	70.60
Total		58	14,589	1,898	28,901	36,899	2,350,821	86	2,350,907	6,211	974	7,712.11	4,762.67	12,466.78

1 Acreage protected listed under "Regular." "Porter pine". Cooperatively protected by owner and M.E.C.W. foremen in valuing.

2 Includes 731 man-days costing $3,321.44 M.E.C.W. supervision and 193 man-days costing $819.04 state supervision. Labor costs based on $1.00 per C.C.C. man day plus cost of labor transportation and supplies. Supervision costs based on salaries and expenses including transportation of M.E.C.W. checkers and foremen, and state foremen directly supervising work.

Table 21.- Local Control, State Park Camps, E.C.W., Michigan, 1933

County	Camp	No. jobs	Acres W. P. protected	Acres worked: Crew	Scout	Total	Ribes pulled: Crew	Supv.	Total	Man-days: Labor	Supervision	Costs: Labor	Supervision	Total
Initial eradication														
Mason	CP-2	1	280	352	435	787	2,053	75	2,128	[1]95	[2]10	$95.00	[2]$10.00	$105.00
Mackinac	Mackinac Island	1	120	220	140	360	20,824	0	20,824	[1]106	[3]31	106.00	[3]144.27	249.27
Total		2	400	572	575	1,147	22,877	75	22,952	160	41	160.00	254.27	414.27

1 Labor costs, $1.00 per C.C.C. man-day of approximately 6 hours on job.
2 Supervision furnished by a checker from E.E.C.W.
3 Supervision furnished by state foreman.

Table 22.- Local Control, E.C.W., National Forests, Michigan, 1933.

Forest	Camp No.	No. jobs	Acres w. p. protected	Acres worked Crew	Scout	Total	Ribes pulled Crew	Scout	Total	Man-days Labor	Supervision	Costs Labor	Supervision	Total
						Initial eradication								
Huron	F-11	12	[1]878	69	3,106	3,157	32,297	0	32,297	129	30.75	$129.00	$139.99	
Hiawatha	F-7	3	1,685	394	3,926	4,320	70,000	3,980	73,980	222	[2]133.25	222.00	[2]734.98	
Ottawa	F-10	1	1 531	1,964	0	1,964	628,418	0	628,418	1,680	[3]240	1,680.00	[3]1,269.68	2,949.68
Cumulative		16	4,094	2,427	7,084	9,441	730,715	3,980	734,695	2,031	403.80	2,031.00	2,143.65	
						2nd eradication								
Huron	F-11	1	300	0	370	370	0	0	0	0	50	0	50.00	
Total		17	4,394	2,427	7,454	9,811	730,715	3,980	734,695	2,031	453.80	2,031.00	2,193.65	

1 Includes 324 acres of white pine planting site.
2 Includes 61-1/4 man-days costing $243.61 E.C.W. supervision, and 77 man-days costing $491.37 state supervision.
3 Includes 153 man-days costing $886.42 E.C.W. and technician supervision, and 87 man-days costing $403.21 state supervision.
Costs of labor based on $1.00 per C.C.C. man-day of approximately 6 hours per day.

Table 23.- Summary, All Local Control Work, Michigan, 1933.

Agency	No. jobs	Acres w. p. protected	Acres worked			Ribes pulled			Man-days		Costs		
			Crew	Scout	Total	Crew	Scout	Total	Labor	Supervision	Labor	Supervision	Total
Initial eradication													
Private cooperation	5	438	776	468	1,?44	304,351	90	304,441	392	94	$844.75	$400.37	$1,2[illegible]
State welfare relief	2	935	958	688	1,646	42,840	120	42,960	151	55	277.20	299.00	576.20
N.R.A.	11	552	978	1,507	2,485	147,445	428	147,873	506	77½	1,941.70	450.33	2,392.03
M.E.C.W.	54	13,824	9,425	23,614	33,039	2,290,298	133	2,290,431	6,409	908	7,678.11	4,104.88	11,782.99
Parks E.C.W.	2	370	572	575	1,147	22,877	75	22,952	160	49	160.00	234.37	394.37
F.S.- E.C.W.	16	4,094	2,407	7,034	9.441	730.715	3,980	734,695	2,031	409	2,031.00	2,164.52	4,195.52
Sub-total	90	20,213	15,116	35,886	42,002	3,038,526	4,826	3,543,302	9,649	1,693½	12,952.76	7,650.47	20,[illegible]
Re-eradication													
M.E.C.W.	2	448	40	841	881	615	0	615	35	6	35.00	35.60	70.60
F.S.- E.C.W.	1	200	0	370	370	0	0	0	0	½	0	2.25	2.25
Sub-total	3	648	40	1,211	1,251	615	0	615	35	6½	35.00	37.85	72.85
Total	93	20,861	15,156	35,097	50,253	3,039,141	4,826	3,543,917	9,684	1,699½	12,987.76	7,021.32	20,[illegible]

Table 24.- Summary of Local Control, Initial Work, Performed by all agencies, Classified by Counties, Upper Michigan, 1933.

County	No. jobs	Acres W. P. protected	Acres worked			Rebs pulled			Man-days		Costs		
			Crew	Scout	Total	Crew	Scout	Total	Labor	Supervision	Labor	Supervision	Total
Alger	3	1,685	394	3,926	4,320	70,000	3,980	73,980	222	158.25	$222.00	$734.92	$956.92
Iron	1	1,531	1,964	0	1,964	628,418	0	628,418	1,680	240	1,680.00	1,249.63	2,929.63
Ontonagon	4	155	399	5	404	212,605	0	212,605	303	46	409.00	196.50	605.50
Delta	2	600	885	0	885	130,605	0	130,605	493	87	664.97	371.25	1,036.22
Houghton	1	155	478	0	478	21,130	0	21,130	66	23	158.40	121.57	279.97
Dickinson	6	1,360	3,150	390	3,540	195,221	0	195,221	643	87	1,036.00	290.45	1,326.45
Menominee	3	615	1,206	0	1,206	150,216	0	150,216	345	61.50	614.84	250.59	865.43
Luce	3	1,009	198	2,820	3,018	17,200	0	17,200	94	54	150.99	212.50	363.49
Marquette	5	644	1,500	375	1,875	314,865	0	314,865	739	109	954.69	503.77	1,458.46
Mackinac	1	120	220	140	360	20,824	0	20,824	105	31	165.00	144.27	309.27
Sub-total	29	8,254	10,394	7,660	18,060	1,761,084	3,980	1,786,064	4,690	846.76	6,797.89	4,115.38	10,913.27
Lower	104	61	18,008	4,722	38,230	30,252	1,779,442	340	1,778,203	4,540	716.76	6,984.47	7,701.23
Total, Inspection	90	20,215	16,112	36,806	40,002	3,540,526	4,126	3,564,265	9,229	1,562.52	12,482.76	7,883.27	20,366.03
Reinspection	2	644	40	1,211	1,251	616	0	616	15	38	16.30	56.00	72.16
Total, Mich.	91	20,861	16,152	38,017	41,253	3,541,142	4,126	3,564,907	9,244	1,600	12,499.76	7,931.43	20,431.19

Table 25.- Summary of Local Control, Initial Work, Performed by all Agencies. Classified by Counties, Lower Michigan, 1935.

County	No. Jobs	Acres w. p. protected	Acres worked Crew	Scout	Total	Ties pulled Crew	Scout	Total	Man-days Labor	Supervision	Costs Labor	Supervision	Total
Charlevoix	1	282	385	100	485	54,412	30	54,442	46	26	$92.00	$119.60	[illegible]
Antrim	1	80	306	0	306	308,359	0	308.359	535	87	940.89	307.52	1,247.41
Ionia	1	15	35	105	140	2,033	50	2,083	6	6	8.00	32.65	41.65
Montcalm	1	40	95	93	196	5,117	0	5,117	[illegible]	12	41.25	60.45	101.70
Kent	6	215	537	690	1,227	39,301	84	39,385	200	40	789.15	221.27	1,010.42
Newaygo	1	19	0	160	160	0	0	0	0	1	0	6.25	[illegible]
Muskegon	1	750	460	698	1,163	21,710	120	21,830	85	32	118.50	177.63	296.13
St. Clair	4	219	299	627	926	46,151	354	46,505	154	27	605.55	135.15	741.70
Mason	1	250	352	435	787	2,053	75	2,128	55	18	85.00	90.10	146.10
Manistee	2	112	44	411	455	2,363	2	2,365	12	9	12.00	56.65	68.65
Gr. Traverse	5	1,750	410	3,691	4.011	260.099	81	260,179	331	115	970.45	306.85	1,277.30
Roscommon	7	1.496	262	3,655	3.917	145.580	0	145.580	533	88	538.40	506.76	917.16
Crawford	5	2,837	301	5,985	6,286	223,309	50	223,359	671	69	881.46	284.50	[illegible]
Oscoda	3	1,166	163	2.955	3,118	260,420	0	260.420	499	63	586.62	325.30	862.42
Otsego	3	1.184	169	2,129	2.298	105.576	0	105.576	342	14	374.30	207.26	582.16
Cheboygan	7	716	1,037	1,288	2,325	237,663	0	237,663	829	107	1.042.73	456.92	1,499.65
Oscoda	10	846	0	2,786	2,786	0	0	0	0	3.30	0	14.09	14.09
Iosco	2	82	49	322	371	32,297	0	32,297	129	27.50	129.00	126.85	[illegible]
[illegible]	61	12,958	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Re-eradication, Lower Michigan

Oscoda	1	200	0	370	370	0	0	0	0	.50	0	1.86	[illegible]
Gr. Traverse	2	443	40	841	881	615	0	615	35	6	35.00	35.60	70.60
[illegible]	3	[illegible]	40	1,211	1,255	615	0	[illegible]	35	6.50	[illegible]	[illegible]	[illegible]
Total	64	12,657	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 26.- Ribes Pulled and Costs per Acre, Initial Ribes Eradication, Michigan, 1933.

Agency or region	Acres worked to protect one acre white pine	Percent of total area worked by crew	Ribes pulled per acre			Acres worked per man-day			Total cost per acre	Pine protected
			Crew	Scout	Total	Crew	Scout	Total	Worked	
Private cooperation	2.8	62	392.2	0.2	244.7	2.0	47.0	3.1	$1.00	46.44
State welfare	1.3	58	44.7	.2	26.1	3.3	68.8	10.2	.35	.82
C.W.A.	4.5	39	150.8	.3	99.5	1.9	94.2	4.7	.96	3.57
U.S.C.M.	2.4	28	245.0	trace	89.8	1.5	56.7	4.2	.72	1.61
Parks E.C.W.	2.1	52	40.0	.1	20.0	3.6	47.9	6.7	.34	1.0
F.S.- E.C.W.	2.3	25	303.6	.6	74.9	1.2	93.8	4.5	.44	1.05
All agencies										
Upper Michigan	2.2	58	169.5	.5	97.8	2.2	49.7	3.7	.56	1.15
Lower Michigan	2.6	15	376.4	trace	57.4	1.0	70.7	5.9	.34	.67
Total	2.4	31	253.1	.1	72.4	1.6	64.0	4.1	.42	1.13

1 Acres covered by scout work per man-day necessarily estimated because most of this work was done by supervisors, whose time was simply designated as supervision. Only 2 man-days labor in Lower Michigan was charged to scout work. It was estimated that 154 man-days supervision was scouting in Upper Michigan, and 780 man-days in Lower Michigan.

Supervision costs include salaries of field supervisors ranging from $110 to $167 per month and subsistence and travel expenses.

Labor costs include labor wages, transportation and equipment. Labor wages in case of C.C.C. camps were same as those used by other projects. Private cooperators' wages figured at approximately $0.25 per hour, 8-hour day; state welfare, $1.25 to $2.40 per 8-hour days; C.W.A., $0.50 per hour labor and $0.60 per hour straw-boss, 30-hour week or 6 hours per day, all C.C.C. labor $1.00 per 8-hour day.

Table 27.- Acres White Pine Protected, Michigan, 1933, Classified by Programs and Ownership

Program	Ownership classes: Private	Municipal	County	State forests	State parks	Forest Service	Total	Percent
Private coop.	458						458	2.1
State Welfare					936		936	4.4
N.I.R.A.	530		22				552	2.6
State E.C.W.	3,355	715		9,765	437		14,272	66.4
Parks E.C.W.					370		370	1.5
F.E. - E.C.W.						4,894	4,894	22.8
Total	4,343	715	22	9,765	1,743	4,894	21,482	
Percent	20.2	3.4	0.1	46.5	8.4	23.6		100.0

Table 28.- Summary by Years, Local Control, Michigan, 1928-1933, Inclusive

Year	Acres marked: Initial	Re-mrkd.	Total	Tubes pulled	Total cost	Per acre: Cost	Ribes	Cost per Rib., cents
1928	1,500	0	1,500	83,051	$738.82	$0.49	55.2	0.89
1929	2,530	40	2,570	171,373	3,607.63	1.40	66.5	2.11
1930	6,510	68	6,578	375,436	5,161.94	.79	56.7	1.38
1931	12,282	0	12,282	505,597	4,379.32	.36	41.2	.86
1932	16,871	420	17,291	1,172,149	7,088.79	.41	67.8	.60
1933	49,902	1,251	50,868	3,343,987	20,659.98	.41	70.5	.58

In table 25 it may be observed that of all the work done in 1928 to 1933 approximately 5% percent was performed in 1933.

Although the average number of miles per acre was highest in 1933 the cost per acre worked was $0.61 per acre, $0.05 less than the average for the six years. The cost per mile pulled was the lowest in 1933.

The status of legal control work in Michigan at the end of 1933 is as follows:

Acres good native white pine	274,060
Acres white pine planted on state lands	39,680
Acres scattered native white pine	710,237
Total acres white pine	1,027,445
Acres white pine initially protected (1915-1933)	58,851
Total acres white pine initially protected, percent	5.7
Acres good white pine initially protected, percent	10.2

Checking

All eradication work performed was checked carefully to qualified men to insure quality work. Areas in which the Ribes population materially exceeded 25 bush of live stem per acre were done over. In only a few instances was it necessary to rework areas.

Checking work on the Ottawa National Forest was done by the becruiser foreman in charge. Each area was checked every day. By this method a very comprehensive check was obtained. An actual check of 30 percent of the area worked was made. A total of 830 acres were examined out of 1,984 acres worked and Ribes were found after eradication at the rate of 4 bush of live stem per acre. The work done was satisfactory.

On the Hiawatha National Forest a check was made of the 4,000 acres worked by means of recording Ribes on check strips 16.5 feet wide spaced at 10-chain intervals. This check showed an average of 3.8 bush of live stem per acre.

On the Huron National Forest 19 acres of Ribes type A (live swamp) were covered by a check on 1.9 acres. In this check an average of 46 bushes with 85.4 bush of live stem per acre was found after eradication in these swamp types.

Agency	Camp or condition	Area sampled (A)	Class	Plots checked	Risk per acre killed	Chief fuel type (Other spec. species)		Remarks
						Native	Planted	
K.B.A.	Emmons Park Kent Co.	41	A	1.0	277	2.0	4.0	
W.P.A.	Greenwood Troy. Kent Co.	77	D	1.0	283	1.0	1.5	
W.P.A.	Ostwick Lake Kent Co.	26	A	1.0	139	1.0	2.5	
M.B.C.W.	T.21N, R.6W Secs. 15, 16	40	A	1.0	719	1.0	.5	
Camp 83-S	T.21N, R.6W Sec. 9, 10	135	A	1.0	93	7.0	1.0	
Camp 85-S	T.21N, R.6W Sec. 8	10	A	1.0	31f	6.0	.5	
Camp 83-S	Leary Estate	122	A	1.0	445	3.0	17.5	
Camp 83-S	Interlochen State Park	10	C	1.0	0	.0	.0	
Camp 83-S	East Bay Park	94	A	1.125	386	10.7	26.3	
Camp 45-S	South Bay Park	1556	E	1.0	0	.0	.0	
Camp 5?-S	Traverse City Park	1	E	1.0	?	2.0	3.0	
Camp 82-S	T.32N, R.11W Sec. 5	40	A	1.0	43	.0	.0	
Camp 82-S	T.33N, R.11W Sec. 6	24	A	1.725	5,413	9.3	24.2	
Camp 82-S	T.33N, R.11W Sec. 6	25	D	1.0	?	.0	.0	
Camp 84-S	Porter Lumber Co.	218	A	1.0	1,172	22.0	133.0	
Camp 84-S	Porter Lumber Co.	404	C	1.0	1,183	3.0	16.0	
Camp 80-S	The Pines	185	A	1.0	1,368	11.0	12.0	
Camp 80-S	Higgins Lake	120	A	1.0	175	12.0	3.5	
Camp 80-S	Mitchell State Park	?	A	1.0	?	8.0	7.0	
Camp 80-S	Mitchell State Park		D	1.0	?	1.0	2.0	
Camp 84-S	Dept Mx Biological Sta.	37	A	1.0	347	3.0	6.0	
Camp 84-S	U.S.F.S. State Forest	792	D	4.0	256	.0	.0	
	Totals or Averages	4,143	A	1.0??	278	2.0	4.0	
		75	C	1.0	1,183	3.0	16.0	
		1,831	E	1.0	257	.0	.0	
		2,0??	D	2.0	?	1.0	2.0	
		7,???		1.??	304	2.?	12.?	

1 Scout - - 2 Estimated

255 acres out of 1,143 of Type A, or 22% should be reworked.
All other types checked were O.K.
255 acres out of 2,801 types checked, or 9% should be reworked.
all

Ribes Type 1 - - Live swamp type (alder, cedar, willow, etc.)
Ribes Type 2 - - Dying swamp.
Ribes Type 3 - - Deadwoods.
Ribes Type 4 - - Pine (white pine, Norway pine, jack pine)
Ribes Type 5 - - Pasture.
Ribes Type 6 - - Cultivated.

Nursery Sanitation

Nursery sanitation was undertaken on four forest nurseries in 1933. The Manistique Forest Service Nursery is a new project and was only started in 1933. When fully stocked it will have a 16,000,000-tree capacity. The eradication of Ribes was started late in the season under somewhat adverse conditions due to fall frost and partial defoliation of the Ribes. This nursery will be thoroughly reworked in the spring of 1934. The Ribes eradication work at the Manistique Nursery is difficult in spots. The Manistique River forms an ox-bow, a portion of which is occupied by a dense swamp which contains large numbers of swamp-type Ribes. The eradication of Ribes from these portions will require several workings. During a portion of the year these swamps are largely covered by water.

The Dunbar Forest Nursery, located near Sault Ste. Marie, belongs to Michigan State College. It was first worked in 1929 and reworked in 1930. In 1932 it was moved 1/4 mile east which made additional eradication work necessary. This control work was undertaken late in the season in 1933 and early frosts brought the work to a close. This nursery will be thoroughly gone over again in the spring of 1934.

The Seal Forest Service Nursery at East Tawas was first worked in 1929 and reworked in 1931. An addition was made in 1932 which necessitated the extension of the 1,500-foot zone farther into the village of East Tawas. This made it necessary to eradicate a number of cultivated Ribes in the village. The Ribes in the new addition outside of the village were not eradicated but a preeradication survey was made in preparation for sanitation measures to be undertaken in 1934. To facilitate this work white stakes were driven at 100-foot intervals to mark the limits of the 1,500-foot zone.

The Higgins Lake Nursery owned by the State Conservation Department located in Crawford County was worked in 1929 and reworked in 1933. Details of the nursery sanitation work done in 1933 are shown in Tables 50 and 51 and a summary of nursery sanitation work in Michigan to date is shown in Table 52.

Cultivated Black Currant Eradication

In Michigan the usual control principle of removing all cultivated black currant bushes systematically from white pine counties is followed. The work is done systematically by men especially trained in the work who cover every road, visit every house occupied or vacant in urban and rural communities and remove all cultivated black currant bushes under state authority. In addition to systematically locating and destroying cultivated black currants the men search for blister rust on such bushes. All pine stands seen are inspected to

Table 30.- Nursery Establishment Work Performed, Michigan, 1939

Item	Township	Trees collected in nursery	Man days labor	Team days labor	Total	Cull, discarded trees	Trees planted	Value	Total	Time worked and remarks
Landelique	[illegible]	80	[illegible]	[illegible]	[illegible]	[illegible]	0	30,150	30,480	1st
Deal - [illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]	0	60	0	60	1st-extension
Deal - [illegible]	[illegible]	90	[illegible]	[illegible]	[illegible]	[illegible]	0	70	0	70	3rd-over work west valley
Dunbar	State	[illegible]	10	62	0	62	0	[illegible]	5,956	6,018	1st
Kelly	State	[illegible]	20	120	264	384	0	0	30,784	30,784	2nd
Total			95	182	174	356	0	110	[illegible]	[illegible]	

1 Cultivated black currants removed as a special project and reported under "Cultivated Black Currant Eradication"

Table 31.- Camp, Nursery Inspection, Michigan, 1939

Name	Man days labor	Man days supervision S.C.W.	Man days supervision E.E.C.W.	Man days supervision State	Man days supervision Total	Labor (W.P.A.C.W.)	Camp Supervision U.S.W.	Camp Supervision Material	Camp Supervision Misc.	Total
Landelique	357	148	0	0	148	[illegible]	720.77	0	0	1,740.77
Deal	0	0	0	[illegible]	[illegible]	0	0	0	16.75	[illegible]
Dunbar	104	[illegible]	0	23	25	110.90	0	0	125.20	[illegible]
Kelly	140	0	10	22	32	120.40	0	125.24	30.23	[illegible]
Total	[illegible]	148	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 32. Nursery, Survey Designation, Acreage, 1925 to 1933

Farm and Nursery Stock Federal State Private	Nursery (Acreage) In nursery	Year planting	Year ordered	Number ordered	Seed eradication Area surveyed (Acres)	Area surveyed (Acres)	Trees inspected	Trees found infested	Trees destroyed	Trees found infested	Trees destroyed	Trees found infested	Trees destroyed
[illegible] Nursery Co.	[illegible]	1st	1927	240	47	2,329	0	0	0	[illegible]	0	[illegible]	[illegible]
[illegible]		2nd	1927	240	0	2,406	0	0	[illegible]		[illegible]	[illegible]	[illegible]
		3rd	1927	240	0	74	0	0	0	[illegible]	0	[illegible]	[illegible]
[illegible] Nursery [illegible] [illegible]	[illegible]	[illegible]	1923	80%	-	80,450	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]
[illegible] — [illegible]	[illegible]	1st	1929	240	0	12,265	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	2nd	1930	200	0	49,24[illegible]	[illegible]	0	0	[illegible]	[illegible]	[illegible]	[illegible]
		1st	1928	240	0	[illegible]	[illegible]	0	0	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Nursery [illegible]	[illegible]	1st	1927	240	0	2,520	[illegible]	0	0	[illegible]	0	[illegible]	[illegible]
[illegible]		2nd	1928	240	0	40,796	[illegible]	0	0	[illegible]	0	[illegible]	[illegible]
[illegible] Nursery [illegible]	[illegible]	1st	1929	240	0	[illegible]	[illegible]	0	0	[illegible]	0	[illegible]	[illegible]
[illegible]		2nd	1931	40	3	45	[illegible]	0	[illegible]	[illegible]	1	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 53.- Cultivated Black Currant Eradication, Michigan, 1935

County	Agency	CBC found: Locations	CBC found: Bushes	CBC destroyed: Locations	CBC destroyed: Bushes	Square miles covered	Number crew days	Square miles covered per crew day	CBC locations per township (36 sec.)	CBC locations per crew day
Upper Michigan										
Delta	U.S.B.E.	?	?	10	123	120	?	?	?	?
Hawkins	U.S.B.E.	?	?	82	91	11	10	24.0	?	?
Schoolcraft	State C.W.A.	?	?	106	506	1,329	?	?	?	?
[illegible]	[illegible]	[illegible]	[illegible]	191	[illegible]	1,460	[illegible]	[illegible]	[illegible]	[illegible]
Lower Michigan										
Alcona	C.W.A.	1	10	1	10	3	3	1.0	12.0	0.3
Algona	C.W.A.	2	12	1	2	12	2	6.0	6.0	1.0
Lenawee	C.W.A.	2	5	2	4	30	5	6.0	2.0	.4
Crawford	C.W.A.	0	0	0	0	14	2	7.0	0	0
Huron	C.W.A.	52	281	28	143	56	8	4.8	30.0	4.0
Iosco	State	3	3	3	3	(Included in nursery sanitation)				
Kent	U.S.B.E.	14	75	13	21	100	1?	?	2.8	1
Kalkaska	C.W.A.	1	4	0	0	14	3	4.7	2.4	.3
Lake	C.W.A.	2	10	0	0	191	3	58.2	.4	.4
[illegible]	C.W.A.	1	12	0	0	15	2	7.5	2.4	.5
Oceana	C.W.A.	3	77	3	37	44	7	6.3	4.2	.7
Osceola	C.W.A.	5	13	1	1	37	6	6.2	2.2	.8
St. Clair	U.S.B.E.	11	37	6	11	10	2?	?	10.0	1
St. Clair	C.W.A.	15	120	8	61	8	2	1.5	32.0	2.0
Manistee	C.W.A.	2	27	2	27	8	4	2.0	8.0	.5
[illegible]	[illegible]	24	[illegible]	16	[illegible]	121	23	1.0	[illegible]	1.3
[illegible]	[illegible]	[illegible]	[illegible]	81	1,110	3,048	63	[illegible]	[illegible]	[illegible]

1 Included under [illegible] crew(s)
Derived ratios [illegible] only on available data

Control		30	1.0	(Incident to progressive control)					
1960	A	94	1,448	471.97	1	0	14,040.07	11	
1950	B	1,824	28 709	0	0	0	21,496 07	11	
1970	A	470	6,405	3,711.11			3,288.1	11	
1940	A	270	3,173	708.70	0		1,788.4	11	
1930	A	334	3,330	0	0	0	720.03	11	
		1	2,514						

County	1939-1942 Cases	1939-1942 Value	1939-1942 Per Head	1943 Cases	1943 Value	1943 Per Head	1939-1943 Cases	1939-1943 Value	1939-1943 Per Head
Allen				1	10	$0	1	10	
Alpena				1	2	$0	1	2	$0
Antrim	5	25	$0	2	5	$0	7	30	$0
Baraga	203	1,075	$0				203	1,075	$0
Barry	42	712	$0				42	712	$0
Berrien	1	75	$0				1	75	$0
Charlevoix	48	384	$0				48	384	$0
Cheboygan	320	1,984	$0				320	1,984	$0
Crawford				0	0	$0	0	0	$0
Delta	32	32	$0	10	101	$0	42	133	$0
Dickinson	256	1,536	$0				256	1,536	$0
Emmet	240	1,440	$0				240	1,440	$0
Gratiot	120	1,020	$0				120	1,020	$0
Huron				1	16	$0	21	168	$0
Ionia	11	55	$0	5	5	$0	16	60	$0
Iron	70	1,050	$0				70	1,050	$0
Kalkaska				0	0	$0	0	0	$0
Kent				13	61	$0	13	61	$0
Lake				0	0	$0	0	0	$0
Lapeer	3	63	$0				3	63	$0
Manistee				21	21	$0	21	21	$0
Manitou	1	1	$0	1	2	$0	2	3	$0
Marquette	1,091	12,091	$0				1,091	12,091	$0
Menominee	39	312	$0				39	312	$0
Missaukee				1	37	$0	1	37	$0
Muskegon	67	670	$0				67	670	$0
Midland	47	423	$0				47	423	$0
Missaukee	60	300	$0				60	300	$0
Montcalm	78	624	$0				78	624	$0
Muskegon	99	1,114	$0				99	1,114	$0
Newaygo	32	192	$0				32	192	$0
Oceana	110	2,860	$0				110	2,860	$0
Oscoda				1	1	$0	1	1	$0
Roscommon	14	263	$0				14	263	$0
Schoolcraft				106	668	$0	106	668	$0
St. Clair				16	192	$0	16	192	$0
Wexford				2	27	$0	2	27	$0
Total	2,900	34,780		219	1,210		3,119	35,990	

[illegible]

[illegible] Plot (on property [illegible]) was [illegible] for experimental work. Certain [illegible] could [illegible] if not [illegible] practical. These areas will be [illegible]. A [illegible] of this work is given in [illegible] printed from the Plantation Annual Report for 1958.

"Experimental Planting, #1 Plot"

"A planting of three species of pine seedlings was made on May 15, 1957 in Plantation County for the purpose of determining their relative susceptibility to Diplodia Tip Blight of Austrian white pine (P. thunbergi), Eastern white pine (P. monticola), and Mexican white pine (P. ponderosa) were planted in alternate rows in a planting surrounded by diseased white pine and trees. As infection occurs the data will be recorded.

"Stolen Lawn - Pine Plot"

"No further work was done on this plot which was established from Test Planting #- 1957. Since that a number [illegible] were planted in this quarter acre plot but we could [illegible] of this fallen which were not recorded because this would [illegible] but [illegible] to [illegible] [illegible] [illegible]

[illegible]

"The [illegible] Spring crop [illegible] Dutch elm disease [illegible] elsewhere [illegible] [illegible] [illegible]

[illegible]

Five C.C.C. men were employed in Marquette County for the purpose of removing cankers from infected pines growing on state land that had been protected. These trees had become infected previous to control work and were located on areas visible from the highways. The purpose of removing off these cankers was twofold: first, to save the trees already protected, and second, to remove unsightly dead branches from stands supposedly protected against blister rust, thus assuring the public that every effort was being made to remove existing infection as well as guarding against its future occurrence. The men did the work on these areas containing 18 acres and removed 53 tree cankers treated and 296 cankers removed at a cost of $98.00 or $1.84 per acre. This work was started in December and will be continued during the winter of 1934.

Costs

In Table 36 is shown a summary of all expenditures incurred on blister rust control by the various agencies during the calendar year 1934. In Tables 37 and 38 the amounts are shown as percentages.

The following points are evident in Table 37:

Nearly all of the costs of general supervision were borne by the "State F.C.W.", "Regular C.C.C.", and "W.P.A." agencies.

Over 81 percent of "C.C.C. Agent Activities" were borne by the "Regular F.C.W." and "Technicians C.C.W."

All of the Park C.C.C. funds and the majority of the Forest Service and State C.C.W. funds were spent on Ribes eradication.

Approximately 12 percent of all funds were spent on supervision, nearly 50 percent were spent on Ribes eradication and nursery sanitation, and nearly 16 percent spent on making pre-eradication surveys in preparation for the coming field season.

In Table 38 the funds shown in Table 36 are shown as a percentage of activity expenditures spent by each agency. The supervisory costs were borne chiefly by the State, Regular C.C.C., W.P.A., and Technicians C.C.W.

The State C.C.W. supplied the highest percentage of funds on Ribes eradication, nursery sanitation and pre-eradication surveys.

Nearly 40 percent of all funds spent in the state were furnished through the State C.C.W.

Nearly 5/6 of the total funds spent on blister rust control were furnished through the various emergency programs.

Table 36.- State and Federal Expenditures for all Blister Rust Control Projects, Michigan, 1953.

Agency	Expenditure classification	Supervision	C.C.C. agency activities	Ribes eradication	Survey sanitation	Cult. blister rust eradication	Pre-eradication survey	Chemicals	Other field data	Equipment and misc.	Total
State	Salaries	$700.00	$175.51	$2,135.68	$110.05	$478.96	$249.55				
	Expenses	106.45	137.36	1,499.68	105.73	457.92	456.83			170.46	
	Total	806.45	312.87	3,635.36	322.15	729.38	804.38			820.46	
Regular S.E.C.	Salaries	823.41	851.86	211.22							
	Expenses	449.88	760.60	172.91						83.94	
	Total	1,028.25	1,613.46	384.13						86.94	
W.P.A.	Salaries	918.66		1,250.59		304.33	1,111.83				
	Expenses	1,373.39		101.01		73.44	623.44			158.26	
	Total	2,292.05		2,051.70		377.77	1,735.27			158.26	
Police S.C.C.	Salaries		442.72								
	Expenses		17.32	1,447.90	110.07	857.74				15.60	
	Total		460.04	11,124.65	359.92	3,503.87				15.60	
Parks C.C.C.	Salaries			160.00							
	Expenses										
	Total			160.00							
For.Ser. S.C.W.	Salaries	90.00		3,050.30	695.56	651.62					
	Expenses			108.57	11.21	60.67				214.07	
	Total	90.00		3,158.87	709.77	708.29				214.07	
Terminations S.C.W.	Salaries		278.84	136.38		283.32	$122.58				
	Expenses		384.08	27.50		320.45	172.75			.64	
	Total		662.92	164.19		603.77	295.33			.64	
C.P.A.	Salaries				281.65			$50.00			
	Expenses										
	Total				281.65			50.00			
Total	Salaries										
	Expenses										
	Total										

Table 87. Percent of Expenditures of each Agency Spent on Each Activity, Michigan. 1953.

Agency	Supervision	S.F.C. agent activities	Home eradication	Nursery sanitation	Cult. Black currant eradication	Pre-eradication survey	Checking	Other field work	Equipment and misc.	Total
State	12.9	4.7	64.3	3.7	10.2	2.1			2.8	100.0
Regular S.F.C.	25.1	62.9	10.2						1.8	100
U.P.A.	38.7		31.0		5.7	22.2			2.4	100.0
State C.C.W.		2.2	59.2	8.0		31.3			.1	100.0
Parks S.C.W.			100.0							100.0
Fay.Co. S.C.W.	1.7		64.7	13.6		14.6			4.4	100.0
Tawas Oscoda S.C.W.		38.6	2.8			56.0	17.3		Lease	100.0
C.W.A.					91.9			8.1		100.0
Total	12.8	7.1	50.4	2.7	1	17	17	1	1.4	100

Table 36.— Percent of Activity Costs Spent by Each Agency. Michigan, 1937.

Agency	Super-vision	C.W.A. agent activities	Ribes eradi-cation	Sanitary sanita-tion	Cult. black cur-rant eradi-cation	Pre-eradi-cation survey	Checking	Other field data	Equip-ment and misc.	
State	17.6	10.3	17.6	11.8	40.6	8.5			51.3	
Regular C.A.A.	24.3	52.9	1.9						9.5	
T.V.A.	46.5		9.9		21.1	24.2			20.5	
State E.C.W.		15.1	53.8	50.7		48.0			8.0	
Parks E.C.W.			8							
Pur. Pro. W.C.W.	3.6		15.2	37.5		9.9			87.8	
Tools division E.C.W.		21.7	.9			6.4	100.0		.1	
C.W.A.					38.3			100.0		
Total	100.0	100.0	99.1	100.0	100.0	100.0	100.0	100.0	100.0	

Recommendations

The guiding principle in the control program is intensive to find and treat every current eradication and will continue operations until no new cases are found in two consecutive years. During 1968, primarily through the emergency relief program, a grand total of 40,268 acres were cleared of 2,182,967 trees in project 20,532 Acres of this was at an average cost of $0.42 per acre or $1.00 per acre for personnel.

Survey evaluation has performed around four recoveries in remote 84,000 trees from 581 acres.

Chiefly on U.S. Trade, evaluation block current eradication accomplished the removal of 1,210 additional block currants from 214 locations. At the close of 1970 systematic block current eradication had been completed in 90 counties and started in 17 others.

In spite of the uncertainty as to the source of funds for daily control work early in 1971 and the late start in the season, a successful control program was made possible, chiefly by virtue of the President's Emergency Conservation Work. Plans are under way for a still larger control program in 1971.

History of the Work

Blister rust control work started in 1917. From 1917 to 1924 efforts were concentrated in eradicating the disease from the ribes by the destruction of ribes and diseased pines in the known infection areas. From 1919 the fertility of entirely eradicating the disease was realized. From 1924 until 1928 the limited amount of control work was confined to the protection of white pine areas by the local eradication of ribes.

From 1925 to 1929 blister rust control work was limited to establishing the rust and studying blister rust damage and ribes segments by one or two men employed during the summer months.

In 1930 a permanent state leader was appointed to work out the administrative direction of the State Forester and to take direct charge of all blister rust control activities in the state under the authority of a blister rust control law enacted by the State Legislature. Under the general plan of work the state will aid pine owners by providing technical men to supervise the eradication of ribes but the cost of labor[illegible] will be paid by the owners.

In 1932 only a limited amount of ribes eradicative work was performed. The chief activities in 1932 were concerned with determining the extent of white pine acreage in the state, making preeradication surveys and locating state local control and cooperating with the State Forest Service in planning for future cooperative control work to be done in each state Forest District. Due to the large amount of acreage under public control and the annually increasing amount due to be delinquented, the local control problem is one largely of state and federal concern.

Organization

Blister rust control work in Minnesota is organized upon a cooperative understanding between the Minnesota State Forest Service and the U. S. Department of Agriculture through its Division of Blister Rust Control. Under the general administrative direction of the Director of the State Division of Forestry, the state leader has charge of all blister rust control work in the state.

Control work in 1932 was accomplished by means of the regular cooperative control program, the State C.C.C., Forest C.C.C., Indian Service C.C.C. programs. In August 1932, CWA funds were available for control work through the National Recovery Administration (N.R.A.) Owing to the lateness of the season when this work was organized much funds were not spent on ribes eradication, but were devoted to public preeradication surveys in preparation for the coming season.

[illegible] control work under the direction of the State [illegible] has performed by the State C.C.C. camps directed by the foresters.

In the Parks C.C.C. camps control work was done in the state parks supervised by the blister rust foremen.

In the Chippewa National Forest control work was supervised by a technical foreman, under his direction control work was performed on [illegible] Forest Service C.C.C. camps. On the Superior a limited amount of control work was performed. However, late in the winter of 1932 two foremen were hired on Forest Service F.C.W. funds to make a preliminary survey of white pine areas on the Superior.

Control work was performed on Indian Service C.C.C. camps on the Red Lake and Vermilion Indian reservations. A project camp was established for control work on the Red Lake Indian Reservation assisted by Indian foremen. On the Vermilion Indian Reservation a limited amount of control work was done by a white foreman hired on F.C.W. funds.

A technician hired on C.W.A. funds through the Bureau of Plant Industry worked with this plan in the C.C.C. program in Minnesota and efficiently organized and supervised control work on the Red Lake Indian reservation until a project manager was available in September.

Under the field program two district agents were hired, one for the northeastern district with headquarters at Duluth and one for the northwestern district with headquarters at Bemidji. Each of these men was assisted by three men hired on F.C.W. funds. The activities under the field program were confined entirely to making pre-eradication surveys of areas within or the working radii of C.C.C. camps.

The work accomplished under these different programs is discussed in detail elsewhere in this report.

Blister Rust Infection

The following discussion of the status of blister rust in Minnesota is quoted from the annual report from Minnesota of 1933, written by Dr. Ritter:

"The spread of blister rust in Minnesota has been slow but [illegible] evidence indicates that first infection on Ribes [illegible] occurred in Otsego and Hennepin counties or in the southern part of the natural pine range. Late extensions of the known range of blister rust point to the western and northwestern range limits of white pine. It is noteworthy that the initial discovery of blister rust infection in the various areas was by reconnaissance and not by the first research unit.

Newer Areas of Blister Rust in Minnesota - (through 1970)

Pine Infections:

*Marshall County	T.[illegible]	*Clay County	T.[illegible]
*Polk County	T.[illegible]	*Hubbard County	T.[illegible]
St. Louis County	T.[illegible]	*Becker County	T.[illegible]

Ribes Infection:

St. Louis County	T.[illegible]	Cook County	T.[illegible]
*Becker County	T.[illegible]	Morrison County	T.[illegible]
*Clearwater County	T.[illegible]		

*Infection found on respective host for the first time
**First reported infection on natural pine

*Counties Known to be Infected Prior to 1956

Pine Infection:

Carlton	Itasca	Lake	Mille Lacs
Cook	Lake	Pine	Aitkin
St. Louis	Chisago	Waseca	Washington

Other Infection:

(Ribes) Cook Carlton

*This summary does not include those counties in which blister rust infection was found in nurseries during the period 1916-1970.

"The outstanding new infection area is located in Cook County, T. [illegible] N., R. [illegible] W., on U.S. Forest Service land within the boundaries of the Superior National Forest. This area was found about June 15th by Technical Foreman Gordon Roe. The area consisted of a few acre pole stands. About 95% of the pine were infected and a number of them killed by the disease. Ribes spp., especially R. triste were abundant and about 10% infected. This infection apparently originated twelve to fifteen years ago. The infected pines were destroyed by [illegible] forces.

"Infection on R. Nigrum was reported from R. Hill, R. 6E, (years ago). This is on the Canadian boundary.

"Shortly after initiating control activities on the Red Lake Indian reserve, Dr. Stewart found infection on both hosts in T. 150N., R. 35W. Beltrami County. Only one pine infection was found and that on a tree about [illegible] old. This infection (cycecial stage) probably originated in 1952 or 1953. Ribes infection was found to be rather general in this area. This location constitutes the northwestern range limit of Eastern white pine.

"Dr. Stewart found infection on R. cynosbati in July 1964 in Itasca State Park (Clearwater and Becker Counties). Later during the summer infection on this host was found in all parts of the park worked. This is a westward extension of the range of blister rust of about forty miles to within thirty miles of the western limits of white pine.

"Other infection areas found during the summer constitute

Agency	District	County	No. camps	Acres to be planted	Trees to be worked by Crew	Scout	Total	Labor employed Crew	Scout
C.C.C.	#1	Chisago	1	700	1,400	0	1,400	200	1
		Isanti	1	500	1,000	0	1,000	200	1
		Kanabec	1	1,600	2,700	0	2,600	200	1
		Morrison	1	1,000	1,500	0	1,600	200	1
		Washington	1	310	500	0	500	200	0
		Anoka	1	100	200	0	200	50	1
		Subtotal	6	4,210	7,400	0	7,400	1,050	6
	#2	Pine	16	512	1,121	1,004	2,205	186	1
		Carlton	21	760	2,207	2,720	4,927	170	0
		Crow Wing &	2	172	426	189	615	91	0
		Lake	3	119	455	36	491	115	2
		Mille Lacs	2	40	77	50	127	25	0
		St. Louis	18	1,834	1,204	587	5,491	2,936	28
		Subtotal	7	3,810	5,490	4,586	10,076	1,191	31
	#3	Morrison, Crow Wing, Cass, Hubbard, Itasca, Beltrami & Koochiching	29	7,500	11,670	1,210	12,880	1,500	40
		Subtotal	29	7,500	11,670	1,210	12,880	1,500	40
State & U.S. Forest Service		White Earth	16	1,025	2,000	1,000	3,000	1,000	5
		Pine Island	2	107	220	325	545	110	1
		Red Lake	5	785	40	1,700	1,740	120	1
		Camp Ripley	5	839	40	1,000	2,200	1,140	2
		Cuyuna Range	2	145	123	105	220	110	0
		Bor.Esp.Sta.	3	29	185	0	100	210	1
		Fond du Lac	4	405	740	165	905	575	1
		Slope of Valley	2	1,120	1,303	0	1,303	1,325	0
		Itasca St.Park	6	657	3,050	402	3,110	1,000	1
		Scenic St.Park	1	696	300	627	927	1,150	0
		Subtotal	46	5,947	8,000	5,429	13,429	5,405	11
Bor.Service U.S.F.S.		Chippewa N.F.	1	5,836	6,650	4,093	9,447	5,370	243
		Superior N.F.	1	7,037	2,445	11,604	13,852	5,132	3,517
		Subtotal	2	12,873	9,095	15,697	23,299	10,502	3,760
Ind.Service U.S.F.S.		Red Lake Ind. Reservation	1	7,705	4,482	7,321	11,803	7,000	0
		Vermillion Ind. Reservation	?	230	350	0	350	518	0
		Subtotal	?	7,935	4,832	7,321	12,153	7,518	0
		Total	90	42,275	64,107	35,453	99,560	27,166	3,848

1 Where no scout man-days are shown for acres to be worked by scout, scout crews have already been worked.

Table 40.- Costs of Pre-eradication Surveys, Minnesota, 1955

Program	State	Total costs pre-eradication survey: State E.D.W.	U.S. E.D.W.	U.S. Technicians E.D.W.	Total	Cost per acre surveyed: Entire plan to area to be reclaimed	Entire plan to area to be reclaimed
W.C.A.	$65.00	$1,257.07			$1,322.07	$0.36	
State E.D.W.	100.15		$2,139.07		2,239.22	.54	
U.S. - E.C.W.	15.00			$1,043.34	1,058.34	.10	
				$540.55 $196.76	737.31	.07	

Tree Location and Pre-eradication Surveys

Pre-eradication surveys were performed by men recruited out of the various C.C.C. camps at the close of the eradication season. The men on Relief funds devoted all of their time from approximately September 15 to November 15 in making pre-eradication surveys on areas outside the various fault of T.V.A. maps. This work is being continued during the winter of 1934. The results will constitute a basis for planning the control program for the 1934 season. No eradication work will be done unless a map and a pre-eradication survey have been prepared for such area.

It was necessary to make pre-eradication surveys and maps prior to the 1933 eradication work. This pre-eradication work is not included in Table 33 showing the pre-eradication surveys of areas to be worked.

In Table 40 the costs of making pre-eradication surveys are shown. It may be noted that the average cost per acre for mapping white pine to be protected is $0.12. In some instances this cost included the actual poisoning of certain areas, so the only control work necessary on some areas will be the area mark. Such areas will not be reported as protected until the necessary area work is also performed.

Local Control

Nearly all of the local control work in Minnesota in 1933 was performed under the various C.C.C. programs. Because of other activities in progress out of C.C.C. camps and because of the necessity for training not only C.C.C. laborers, but also directors and supervisors in methods of white eradication, C.C.C. control activities were started late. It was the middle of July before very much local control from C.C.C. camps was started. However, it is believed that the amount of work done is satisfactory, considering the obstacles that had to be surmounted.

The small amount of regular cooperative control accomplished was performed in Cass Pine County supervised by Extension Forest Agent and in Mt. Davis River valley, Washington County, where the second eradication of Pitch Pine from the Davis property was performed.

Local control performed in Minnesota in 1933 is shown classified by agencies and locations in Tables 41 and 42.

The most expensive white eradication job, as noted in Table 42, was that of protecting the pines in the Cloquet Forest Experiment Station where the costs per acre worked amounted to $1.05 and per acre of pine protected $2.36. Trees were pulled at an average of 2,192 trees per acre. The reason for this high cost job being performed was that since this was an experimental forest it was deemed desirable to preserve the white pines regardless of costs.

Table 47.- Local Control, Initial Eradication, All Agencies, Minnesota, 1953

Agency	Location	County	No. areas	Acres w.c. protected	Acres worked Crew	Scout	Total	Ribes mulled Crew	Scout	Total	Labor
Regular	Various	Crow Wing	15	925	115	10	800	11,274	0	11,274	[illegible]
State	Cloquet Valley	St. Louis	2	400	605	40	645	174,042	0	174,042	348.00
B.C.W.	White Earth	Clearwater	3	79	109	175	284	91,183	8,097	99,280	227.00
	Geo. Washington	Itasca	7	991	45	2,713	2,758	20,893	0	20,893	122.75
	Cloquet Exp. Sta.	Carlton	1	14	42	80	122	267,851	0	267,851	415.00
	Camp Ripley	Morrison	1	90	845	1,353	1,398	14,217	0	14,217	155.30
	Third River	Itasca	1	8	0	120	120	0	0	0	0
	Total		25	1,507	1,000	4,391	5,387	579,460	8,097	587,557	1,267.05
Forest	Itasca St. Park	Itasca	3	1,698	950	2,844	3,794	224,109	1,900	226,109	1,531.50
B.C.W.	Scenic St. Park	Itasca	1	344	449	420	869	119,087	0	119,087	695.00
Forest	Chippewa N.F.	Itasca	12	1,460	476	3,697	4,175	150,008	728	150,736	1,480.00
Service	Superior N.F.	St. Louis	2	120	2	435	437	1,821	0	1,821	4.00
B.C.W.			14	1,580	478	4,132	4,610	151,829	728	152,557	1,484.00
Indian	Red Lake Ind. Res.	Beltrami	4	1,948	880	2,580	2,786	444,649	0	444,649	1,011.00
Service	Vermillion N.F.	St. Louis	1	Inc.	80	0	80	27,100	0	27,100	119.00
B.C.W.	Total		5	1,948	960	2,580	2,866	471,749	0	471,749	1,130.00
	Grand Total		50	6,477	3,888	13,503	17,391	1,294,314	8,825	1,303,139	3,881.05

Second eradication

Regular	St. Croix River Valley	Washington	1	80	45	0	45	4,000	0	4,000	8.00
	Grand Total		51	6,557	3,933	13,503	17,436	1,298,314	8,825	1,307,139	3,889.05

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Table 42.- Local Control, Initial Eradication- All Agencies, Minnesota, 1933 (Costs)

Agency	Location	Costs				For acre Costs			Acres worked per man-day labor	Acres worked to protect 1 acre	Percent area worked
		Labor	Supervision	Other	Total	Worked	Protected	Ribes			
Regular	Various										
State	Cloquet Valley	340.00	114.37	66.50	720.87	1.13	1.58	270	1.2	1.6	
E.C.W.	White Earth	327.00	283.71	6.93	617.64	2.17	7.82	350	.9	3.6	
	Geo. Wash.	195.75	151.25	.77	324.77	.13	1.16	3	14.6	9.9	
	Cloquet Exp. Sta.	412.00	175.00	4.62	591.62	4.85	42.26	2,194	.3	3.7	
	Camp Ripley	156.00	143.48	70.95	370.43	.13	4.12	7	12.8	22.3	
	Third River	0	6.00	0	6.00	.04	1.00	0	0	24.0	
Parks	Itasca St. Park	1,541.90	1,253.91	78.67	2,874.08	.76	1.51	69	2.6	2.0	
E.C.W.	Scenic St. Park	721.50	346.00	49.39	1,118.89	1.36	3.25	127	1.3	2.5	
Forest	Chippewa N.F.	1,573.44	566.68	216.30	2,456.42	.59	1.67	31	2.3	2.9	
Service	Superior N.F.	6.00	150.00	0	156.00	.31	1.30	3	124.3	4.1	
E.C.W.											
Indian	Red Lake Ind.Res.	2,481.54	436.08	100.00	3,017.62	1.09	1.38	181	2.7	1.4	
Service	Vermillion Ind.Res.	280.00	147.00	0	427.00	4.36	Inc.	589	.7	1	200
E.C.W.											
	Total										

Second eradication

Regular	Various										

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Rabbit local control in Minnesota in 1938 resulted in the protection of 6,072 acres of white pine by removing 1,141,181 rabbits from 13,733 acres. Hares were pulled at an average of 22 per hour. An average of 2.6 acres was worked per man day of labor. The average cost per acre worked was 10.89, not one of pine protected plots.

In table 43 control work done in Minnesota in 1938 has been classified according to counties.

Table 43.- Local Control, by Counties, Minnesota, 1938

County	Program	No. crews	Acres worked by crews	Acres worked	Rabbits pulled	Man-days labor	Man-days supervision
Beltrami	[illegible]	1	1,[illegible]	6,[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1	14	182	[illegible]	418.00	[illegible]
[illegible]	[illegible]	2	70	864	99,[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Itasca	Stevens-Clay Martin-Tripp Johnson-Cass Todd-Wadena	21	3,995	11,734	496,[illegible]	3,897.83	[illegible]
[illegible]	Stearns-Pope	1	90	1,[illegible]	14,[illegible]	154.00	[illegible]
St. Louis	Koochiching Itasca-Clay Lake-St. Louis	5	530	1,[illegible]	[illegible]	[illegible]	[illegible]
Multigeous Regular		1	80	80	2,[illegible]	5.00	[illegible]
Total		50	6,[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1 Cutting for amputation

In Table 44 it may be noted that only 1 percent of the acreage of white pine protected was in private ownership, whereas nearly 51 percent [illegible] Federal control.

Table 44.- Acres of White Pine Protected Initially According to Ownership and Progress, Minnesota, 1933

Progress	Ownership classes						
	Private	State forests	State parks	Forest Service	Indian reserves	Total	Percent
Private Coops.	275					275	0.0
State - C.C.C.		660				660	12.1
Parks - C.C.C.			2,242			2,242	40.8
U.S. - C.C.C.				1,500		1,500	27.4
C.C.C. - C.W.A.					1,815	1,815	33.1
Total	275	660	2,242	1,500	1,815	5,492	
Percent	4.0	12.0	32.8	28.0	33.1		100.0

In Table 45 is shown a summary of all control work done in Minnesota from 1910 to 1933. It may be noted that the average number of trees planted per acre in 1933 is close to the average for all years worked, although the cost per acre worked in 1933 was $0.80 as contrasted with $1.12 average cost per acre for all years. Unlike by the Georgetown Conservation Work program, which consist of the average worked from 1910 to 1933 was worked in 1933.

Table 45.- Summary of Local Control in Total, Minnesota, 1911 to 1933

Year	Acres worked			Total trees planted	Total cost	Per acre	
	Initial	Inspection & grade	Total			Cost	Trees
1911	1,200	0	1,200	30,000	$ 60.00	$.50	25
1919	2,440	0	2,440	146,400	2,196.00	.90	60
1920	277	0	277	180,415	3,180.65	7.68	651
1921	589	0	589	58,900	353.77	.60	100
1922	75	0	75	64	25.00	.34	1
1930	1,186	822	1,008	78,080	[illegible]	.08	8
1931	478	864	742	148,170	1,074.08	1.45	199
1932	1.4	40	184	23,040	184.32	.80	125
1933	10,611	60	16,671	1,644,370	12,819.81	.68	97
Total to date			24,200	2,460,100	20,[illegible]	[illegible]	

The status of local control work at the end of 1933 may be summarized as follows:

Estimated acreage of white pine in the plantations - - - - - - - - - 1,063,7
Estimated acreage of white pine initially protected (1911 - 1927) - 1[illegible]
Acres white pine initially protected to date, present - - - - - - - - 5,4

Table 46.— Results of Shocking, Minnesota, 1933

Agency	County or Location	Water type	Acres treated by area	Ribes per acre treated	Acres checked	Ribes per acre after eradication		
U.S. - U.S.F.	Red Lake - Sl. 1	A	70	1,267	4.0	39.2	21.0	[illegible]
	Red Lake - Sl. 1	[illegible]	57	870	3.5	4.0	[illegible]	[illegible]
	Red Lake - Sl. 2	A	86	1,006	1.9	6.7	12.0	0.5+
	Red Lake - Sl. 3	A	81	2,120	.75	12.0	20.0	(Scattered [illegible]
	Red Lake - Sl. 4	C	130	1,130	4.0	20.2	26.7	(west line.
	Red Lake - Sl. 5	[illegible]	184	[illegible]	4.0	9.3	5.2	0. E. Sides)
	(Scarified)							
	[illegible] (first year)		180	1,200	11.0	15.7	22.4	0. E. [illegible]
U.S. - U.S.F.								
Chippewa Forest	Cass Lake	I	219	181	4.3	I	2.9	0. E.
	Cass Edge	I	178	2[illegible]	2.9	I	7.2	0. E.
	Winnie Dam	I	64	850	1.4	I	5.9	0. E.
	[illegible]	I	2[illegible]	171	4.0	I	[illegible]	0. E.
State - U.S.F.	All camps	I	[illegible]	[illegible]	[illegible]	I	11.0	0. E.

(Key: Type I - Live swamp (alder, cedar, willow, etc.)
Ribes Type C - Scarified, with or without white pine

In Table 45 are given the results of checking the preliminary work performed by the various R.A.F. agencies. In addition to the systematic checking, frequent semi-formal checks were made and crew work inspected by the supervisory forces.

It may be noted from Table 45 that the average of work done was decidedly below the maximum of 25 feet of live stem per acre allowed. In one instance, on the Red Lake Indian Reservation, a portion of an area on which 8,814 feet of live stem after eradication was found to be 36.7 per acre that portion was rerecked and the 8,814 feet of live stem brought down to an average of 8.2 feet of live stem per acre.

The areas shown as checked were those worked by the crew and were areas on which prior to eradication the greatest concentration of ribes occurred. No checks are shown for the areas scouted. Areas covered by the scout method are for the most part ribes free or very nearly so. If these areas had also been included in the check the resultant figure of ribes left per acre would be decidedly smaller than that shown in Table 45.

As is evident from Table 46, remarkably good work was done on the Chippewa National forest where the areas worked by crew showed an average of only 5.6 feet of live stem per acre left after eradication.

Ribes eradication work performed on the Red Lake Indian Reservation was also of a high quality. There was an average of 1,209 ribes bushes per acre pulled, leaving after eradication an average of 11.7 bushes and 11.0 feet of live stem per acre -- an average of less than 1 foot of live stem per bush.

Details of the checking work performed in the State R.A.F. camps are not at hand. However, it is apparent that satisfactory work has been done from these camps.

Nursery Sanitation

The changes in the Federal White Pine rust quarantine regulations, effective January 1, 1935, created increased interest on the part of commercial nurseries and an increased number of requests for federal white pine shipping permits.

Nursery sanitation in and the Bailey, Lake City, and Perdale Nurseries was supervised by Mr. Jones. Mr. Perlin of the Bureau of Plant Quarantine inspected the nursery sanitation work around these nurseries and found that it was not up to nursery sanitation requirements. The sanitation rules around these nurseries were remedied later in the summer. Mr. Perlin contributed his time towards supervising the work and assisted materially in making the nursery sanitation rules ribes free.

Mr. Perlin found pine infection on white pines growing in the Perdale Nursery. This finding of the rust within the nursery

Table 4B.- Costs, Nursery Sublibton, Minnesota, 1938

Nursery	Costs - labor				Costs - supervision					
	Owner (private)	State C.C.C.W.	U.S. Dept. P.W.	Total	Costs	Regular Federal C.C.C.	State C.C.C.W.	U.S. C.C.C.	Total	Total
Bailey	$30.60	0	0	$39.60	$54.26	$36.17	0	0	$90.43	
Lake City	120.90	0	0	120.90	125.60	35.86	0	0	161.46	
Spreadale	60.30	0	0	60.30	53.00	47.11	0	0	100.11	
Clermont Exp. Sta.	28.10	179.00	0	207.10	5.00	12.00	$54.00	0	71.00	
Mica Lake	0	13.50	0	13.50	0	0	24.00	0	24.00	
Medoura	16.60	188.00	0	204.80	75.90	0	0	0	75.90	
Cedo Lake	0	0	$265.60	265.60	43.00	12.00	0	$106.12	162.12	

1 Includes $31.00 cost of furnishing nursery stock to owners living on cultivated sites, paid by state

Table 49.- Summary, Nursery Sanitation, Minnesota, 1930 to 1933

Name and location Federal-State-Private	Acres protected in nursery	Work-ing	Year worked	Acres worked	Ribes eradication: Ribes pulled Cult. C.C.	Ribes pulled Other Ribes	Costs: State E.C.W.	F.S. E.C.W.	Regular Federal	State R.R.C.	Owner	Total	Remarks
Bailey Nursery (private) Newport, Minn.	10	1st	1933	260	1	8,252	0	0	$36.17	$54.25	$39.60	$130.02	Worked twice in 1933
Lake City (private) Lake City	10	1st	1933	200	0	25,315	0	0	55.86	125.60	120.90	302.56	Worked twice in 1933
Ferndale (private) Askov	10	1st	1931	160	46	5,152	0	0	10.00	5.00	45.00	60.00	Pine infection found in nursery in 1933
		2nd	1933	100	0	7,096	0	0	42.11	58.00	60.80	160.91	
St. Louis Co. Work Farm (county) St. Louis Co.	50	1st	1931	40	0	88,553	0	0	24.83	0	240.00	264.83	Ribes heavy in swamp. Different areas worked in 1931 and 1933
		1st	1932	30	0	3,000	0	0	21.00	6.00	42.75	69.75	
Cloquet Forest Exp.Sta. (state) Cloquet	20	1st	1930	33	0	24,931	0	0	30.15	13.06	73.20	116.41	Work done yearly by forestry students as training. State CCW labor also used 1933. Infected Ribes found in zone 1933
		1st	1931	20	4	22,600	0	0	14.35	10.00	77.35	101.60	
		1st	1932	10	0	7,000	0	0	10.00	2.00	30.80	42.80	
		1st	1933	104	0	30,827	$273.00	0	12.00	6.00	28.10	376.10	
Badoura Nursery (state)	20	1st	1933	27	0	37,142	188.00	0	0	75.90	16.80	280.70	
Side Lake (state)	20	1st	1933	240	0	17	67.50	0	0	0	0	67.50	New 1933
Cass Lake (F.S.)	20	1st	1930	250	30	6,900	0	0	33.73	20.00	0	53.73	Included under state are costs of cultivated Ribes pulled as follows: 1931 $97.55; 1932 $50.; 1933 $31.00 - total of $178.55
		2nd	1931	60	25	5,875	0	0	18.35	113.35	24.00	156.70	
		3rd	1932	77	4	5,413	0	0	40.00	60.80	41.80	147.80	
		4th	1933	331	0	17,370	0	375.72	12.00	43.00	0	428.72	

Table 49.- Summary, Nursery Sanitation, Minnesota, 1930 to 1933

Name and location Federal State- Private	Acres protected in nursery	Work- ing	Year worked	Acres worked	Ribes eradication Ribes pulled Cult. W.C.	Other Ribes	State E.C.W.	U.S. E.C.W.	Costs Regular Federal	State E.R.C.	Comm:
Bailey Nursery (private) Newport, Minn.	10	1st	1933	260	1	0,252	0	0	$36.17	$54.25	$39.0
Lake City (private) Lake City	10	1st	1933	200	0	25,315	0	0	55.66	125.60	120.(
Ferndale (private) Ashby	10	1st	1931	160	46	3,152	0	0	10.00	5.00	45.(
		2nd	1933	100	0	7,999	0	0	42.11	58.00	60.
Mt. Louis Co. Park Dara (county) Mt. Louis Co.	60	1st	1931	40	0	68,653	0	0	24.63	0	240.
		1st	1932	30	0	3,000	0	0	21.00	6.00	42.
Cloquet Forest Exp. Sta. (state) Cloquet	20	1st	1930	35	0	24,931	0	0	30.15	13.06	73
		1st	1931	20	4	22,600	0	0	14.35	10.00	77
		1st	1932	10	0	7,000	0	0	10.00	2.00	30
		1st	1933	104	0	30,827	$238.00	0	12.00	6.00	28
Badoura Nursery (state)	20	1st	1933	27	0	37,142	188.00	0	0	75.90	1
Side Lake (state)	20	1st	1933	240	0	47	37.50	0	0	0	
Cass Lake (F.S.)	20	1st	1930	250	30	0,900	0	0	33.73	20.00	
		2nd	1931	60	25	5,875	0	0	18.35	113.35	
		3rd	1932	77	4	3,413	0	0	40.00	60.00	
		4th	1933	351	0	17,570	0	375.72	13.00	43.00	

eliminated the possibility of the issuance of even a limited Federal pine shipping permit. It is very probable that the Ferndale Nursery will discontinue growing white pine.

Nursery sanitation around the Forest Service Nursery at Cass Lake was supervised by Technical Foreman Adams. Labor was furnished through the C. C. C. program. Within the sanitation zone around this nursery there is a live swamp containing a large number of Ribes. Although Ribes eradication work had been performed around the Cass Lake Nursery in 1930, 1931, 1932 and 1933, there were still too many Ribes to meet nursery sanitation requirements. The worst portions were worked twice in 1934. Mr. Carlise also assisted in nursery sanitation work at Cass Lake.

Nursery sanitation work at the George Washington Memorial Forest Nursery located at Badoura, Hubbard County, was supervised by Mr. Dahl State & C.C. labor was employed. The major portion of the sanitation work areas around the Badoura Nursery was jack pine and naturally Ribes free. However, a heavy near the nursery contained many Ribes.

The establishment of the Side Lake Nursery sanitation zone was accomplished by State Blister Rust Checker, Ed Fonda. The sanitation zone area around this nursery was quite free from Ribes -- only 47 bushes being found.

Nursery sanitation work in the Cloquet Forest Experiment Station Nursery was supervised by State Leader L. E. Gibbs and State Checker E. J. Murphy. This area for the past several years has been used as a training school to train forestry students at the University at Minnesota in methods of Ribes eradication. In addition to the employment of forestry students C. C. C. labor was also used.

The nursery sanitation work performed in 1933 and costs thereof are shown in Tables 47 and 48. In Table 49 is shown a summary of all nursery sanitation work performed in Minnesota to date.

Informational Activities

Information on blister rust control was disseminated through newspaper and magazine articles, show window displays, exhibits and radio broadcasting plays, talks, field demonstrations of blister rust control and individual contacts with pine owners.

No record is available as to the number of newspaper and magazine articles. Fifty-four lectures were given in which slides and motion pictures were shown to 7,207 persons. One demonstration was set up at the State Fair and one at the Flower Show given by the Duluth Garden Society at Duluth.

Late in 1932 the State Leader prepared a correspondence course in General Forestry and Blister Rust Control for the field personnel

of the Bureau of Forestry. It was found to be unsatisfactory for showing the costs. A study of the data was undertaken to determine why it was unsatisfactory for that purpose.

Costs

In Table 20 the total expenditures incurred in this state on various projects are shown in the amount of $26,272.61. Of this amount approximately 84.2 percent was spent for salary and wages and 15.8 percent for expenses.

The figures set up in the costs shown in Table 20 are expressed in percentages.

It may be noted from Table 21 that the majority of state and regular C.C.C. funds are spent on supervisory activities.

A considerable portion of the state contribution was spent on nursery sanitation. This item is made up chiefly of primary unskilled labor spent on nursery sanitation.

The two specific C.C.C. funds (white) which are a portion of the year the white C.C.C. funds were spent on pre-sanitation surveys.

A high proportion of C.C.C. funds with the exception of the white C.C.C. expenditures were spent on local control. A considerable amount of these funds was also spent on pre-sanitation survey.

Eighty (80) percent of the costs of the technicians C.C.C. was charged to F.E.C. agent activities. This cost included the salary and expenses of Technicians Stewart and Caswell while they were in Minnesota they were charged to F.E.C. agent activities because they were giving supervision to an assigned district by the state.

Practically 90 percent of all expenditures in Minnesota went to pine blister eradication and nursery sanitation. Practically one-third of the funds were spent in making pre-eradication surveys in preparation for the coming field season. Approximately 10 percent was charged to general supervisory activities, such as supervision and F.E.C. agent activities.

It is noted from Table 22 that nearly all of the cost of supervision is borne by the State, Regular, C.C.C., and F.E.C.

The highest percentage carried under F.E.C. agent activities is charged to the technicians.

The four C.C.C. agencies were charged with 83.7 percent of the cost of blister eradication.

Nursery sanitation expenditures were made by the State, State C.C.C., Forest Service C.C.C., and Regular C.C.C. in descending order.

Table 50.- State and Federal Expenditures for all Blister Rust Control Projects, Minnesota 1935

Agency	Expenditure classification	Supervision	C.C.C. agent activities	Ribes eradication	Survey examination	Pre-check-location survey	Clearing	Total
State	Salaries	$528.80	$161.60	$129.38	$493.35	$51.60		$1,313.97
	Expenses	270.62	230.38	55.96	154.60	176.85		374.21
	Total	799.12	391.98	185.27	627.95	210.45		2,188.18
Regular E.R.C.	Salaries	325.23	525.20		159.14			1,209.72
	Expenses		2.36					2.25
	Total	325.90	527.51		159.14			1,210.47
W.P.A.	Salaries	615.38				2,625.69		3,240.47
	Expenses					1,530.48		1,530.48
	Total	615.38				4,257.07		4,770.95
State E.C.W.	Salaries			3,703.55	460.60	2,081.35	$85.00	6,350.51
	Expenses	107.70		156.18		87.89		351.71
	Total	107.70		3,959.75	460.60	2,139.07	85.00	6,750.02
Parks E.C.W.	Salaries			2,593.21				2,593.21
	Expenses			61.34				61.34
	Total			2,669.55				2,669.55
For. Ser. E.C.W.	Salaries			2,396.12	373.72	843.14		3,612.98
	Expenses			216.30		1200.00		416.30
	Total			2,612.42	373.72	1,043.14		4,029.28
Ind. Ser. E.C.W.	Salaries			3,155.67		340.56		3,496.23
	Expenses			258.95				258.95
	Total			3,414.62		650.56		3,755.17
Technicians E.C.W.	Salaries		730.44			58.52		858.96
	Expenses		196.36			98.24		294.60
	Total		1,258.80			156.76		1,453.56
[illegible]	Salaries	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Expenses	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1 Estimated.

Table [illegible] Percent of each Agency Expenditure spent on [illegible] Project, Minnesota, 1951

Agency	Engineering	Legal agent activities	Land acquisition	Property negotiation	Property management	Planning	Total
[illegible]	19.5	10.7	0.5	70.3	0.0		100
[illegible]	13.4	10.5		76.0			100
[illegible]	11.5				88.5		100
[illegible]	1/		[illegible]	[illegible]	83.7	16.3	100
[illegible]	[illegible]		[illegible]		[illegible]		100
[illegible]	[illegible]	14.3	5.3		35.2		100
[illegible]		45.8			54.2		100
[illegible]	31.3				77.7		100
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table [illegible]. Percent of each project expenditure spent by each Agency, Kenneba, 1985

Agency	Supervision	Agent activities	Area sensitizing	Nursery verification	Field tests: On-station verification survey	Training	Total
Stake	29.0	17.3	2.2	38.6	2.6		5.4
Segoua	25.7	24.7		9.8			1.0
Bakoa [illegible]	[illegible]				12.0		16.1
Stake [illegible]	4.3		90.7	25.8	21.1	100	25.2
Yaka [illegible]			2.6				0.3
[illegible]		50.1	85.1	24.8			2.0
Ind.Sup.[illegible]		25.9			4.1		7.9
[illegible]	67.5				7.4		1.4

[illegible] State [illegible]. Funds were [illegible] for [illegible] evaluation survey were purchased.

Practically 25 percent of the total expenditures were paid by the State [illegible]. In descending order the funds paid from other sources were as follows: [illegible], Forest Service [illegible], Indian Service [illegible], Soil [illegible], State Reclamations and Trades [illegible].

Practically 50 percent of the funds spent in Minnesota were [illegible] through the different [illegible] agencies.

Summary and Conclusions

The year 1953 ushered in a greatly enlarged blister rust control program in Minnesota, principally through the Emergency Conservation Work and National Recovery Administration programs. By means of these programs a gratifying acreage of white pine was given initial protection and preparations necessary and plans were made in preparation for an enlarged program in 1934.

Blister rust was found generally extended over the entire white pine growing region. Several severe outbreaks of the rust not previously known were found.

With trained men available and with pre-eradication surveys as a basis for good planning, it is expected that an enlarged program of blister rust control will be performed in 1934.

History of the Project

[illegible] water cress control work started in 1941 when a small appropriation of $7,600.00 annually was made available. This amount was accumulated during each of the fiscal years 1942 and 1943. In the fiscal year 1944 the amount was reduced to $4,000.00 annually and this amount was appropriated each year to and including the fiscal year ending June 1950 no state appropriations have been made for Water Cress Control. However, a limited amount of control work has been performed since then through funds received from other state agencies, principally the Department of Agriculture and Markets and the Department of Conservation and from assistance given by a few individual municipalities. A limited amount of federal funds have been available each year since 1949.

In 1955 a definite control program was started, and a permanent state leader was appointed to take charge of all Water cress control activities in the state.

From 1941 to 1955, nearly 85,000 acres were initially cleared of Cress. Only a very limited amount of control work was done from 1951 to 1956, inclusive. In 1957, 3,237 acres were initially worked and 1,647 acres worked for the second time.

In 1958, nearly 11,000 acres were initially cleared of Cress by cooperative control projects. Water cress control as a work relief project was used extensively by city and county authorities in 1958.

Organization

Water cress control work in Wisconsin since 1950 has been organized under a cooperative arrangement between the Wisconsin Department of Agriculture and Markets, the Wisconsin Conservation Department and the U. S. Department of Agriculture through its Division of Water Cress Control.

All water cress control is supervised by a permanent state leader whose salary and expenses are borne by the U. S. Department of Agriculture. The state leader works under the administrative direction of the Entomologist in charge of the Division of Insect and Plant Disease Control in the Department of Agriculture and Markets.

The Wisconsin Department of Agriculture and Markets through its Division of Insect and Plant Disease Control, in addition to exercising administrative direction of the work, furnishes financial aid for survey work and administers state laws and regulations necessary for effective control.

[illegible] Riverside Conservation Department organization is unique in that it operates and personnel available to control work and to allotting funds for field inspection work on lower reaches of almost exclusively.

The Department of Agriculture through its Division of Plant Quarantine Bureau Plant Pest Control Inspectors and Supervisors for inspections and control work in the state.

In 1953 control work in Riverside was performed by owners of land's chemical trucks

Mr. [illegible]
Inspector in Charge
County Agricultural Commissioner
Deputy County Agricultural Commissioner
Supervising Agricultural Inspector
Inspector, Agricultural Pest Control
Plant Quarantine
Pest Control
Seed Inspection
Field Crops Investigations (Entom.)

Work [illegible] Riverside Department of Agriculture was carried out under the supervision of [illegible] in charge of the work in the 11 ranges.

In the case of the [illegible] owners [illegible] control work on [illegible] each method, using [illegible] surveys within the [illegible] ranges in preparation for the 1953 field season.

Table 8a.— [illegible]

Year	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1927	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]		
		[illegible]		[illegible]		
		[illegible]				
		[illegible]				
		[illegible]				
1928				[illegible]		
1929	[illegible]					
1930	[illegible]		[illegible]			
1931	[illegible]			[illegible]		
	[illegible]					
1932	[illegible]			[illegible]	[illegible]	
	[illegible]			[illegible]		
	[illegible]					
	[illegible]					
	[illegible]					
	[illegible]					
1933	[illegible]			[illegible]		
	[illegible]					
	[illegible]					
	[illegible]					
	[illegible]					
	[illegible]					
	[illegible]					

Status of Pest

"Infections Found in New Counties During 1933

"(a) Ribes Only

"1. Oneida County. Infection on one Ribes hirtellum bush. Location in Section 25, Township 39 North, Range 7 East. Discovered by Arthur Knutson, E.C.W. blister rust foreman at the Blue Lake State E.C.W. camp, on August 20, 1933.

"2. Langlade County. (a) Infection on one Ribes cynosbati bush. Location: north side of county trunk highway "A", in pasture, 6½ miles due west of Phlox, Wis. Two leaves lightly infected, uridinia 25%, telia 75%. Fourteen cynosbati bushes were examined. Found by T. F. Kouba, on August 10, 1933. (b) Infection in NW¼ Sec. 34, T32N, R11E, on Ribes cynosbati. Two leaves found infected on one bush. No further infections found. Infection in Sec. 20, T33N, R13E, on two Ribes cynosbati bushes. Found by Ray Adams, E.C.W. blister rust foreman in the Elcho State E.C.W. camp, on September 27, 1933. (c) Infection on one Ribes cynosbati bush. Large number were examined. Location in Sec. 20, T33N, R11E. Discovered by F. O. DeWalt, E.C.W. checker, on October 2, 1933. (d) Infection on eight leaves of one Ribes triste in Sec. 25, T32N, R11E. Approximately twenty bushes were examined. Found by Ray Adams, blister rust foreman at the Elcho State E.C.W. camp, on October 8, 1933. (e) Infections were also found during the month of September, 1933, by Ray Adams, in Secs. 25 and 34, T32N, R11E; Sec. 5, T33N, R12E; Secs. 20 and 29, T33N, R13E, and Sec. 34, T34N, R12E.

"3. Vilas County. Infection on three Ribes cynosbati of 318 bushes examined. Uridinia 85%, telia 15%. An extremely light infection totaling three leaves. Location, in pasture on north side of county trunk highway "F", approximately eight miles east of Phelps, Wis. Discovered by T. F. Kouba, on August 14, 1933.

"(b) On White Pine

"1. Waukesha County. (a) Spot infection in NE-NE, Sec. 5, T4N, R19E. Two pines infected. Discovered by E. R. Blevin, C.W.I. blister rust foreman, on December 17, 1933. (b) General infection in NW-SW, Sec. 32, T37N, R13W, found by E. R. Blevin, C.W.I. foreman, on December 28, 1933. (c) Spot infection in SE-NW, Sec. 28, SE-NE, Sec. 16, NW-SE, Sec. 29, in T37N, R12W. Discovered by E. R. Blevin on December 27, 1933.

"2. Bayfield County. (a) Extremely heavy infection in W½, Sec. 7, T48N, R8W. Between two hundred and three hundred trees found infected. Oldest infection 10 years. One stem canker seen on tree eight inches D.B.H. Ribes species present were R. cynosbati, R. glandulosum, R. triste, and R. hudsonianum. Infection discovered by H. H. Jacobson, blister rust foreman at the Solon Springs State E.C.W. camp, on October 8, 1933. (b) Infection on six Ribes cynosbati. Thirty-nine bushes were examined. Location, both sides of road, approximately one mile east of Cable, Wisconsin. Found by H. N. Putnam and T. F. Kouba, on July 10, 1933.

[illegible]

[illegible]

[illegible]

Table 54.- Pre-eradication survey, Emergency Conservation Work (State Camps), Wisconsin. 1935.

Camp	Acres good white pine mapped	Man-days C.C.C.	Man-days supervision	Cost of labor[1]	Supervision costs: Salaries	Supervision costs: Transportation and subsistence	Supervision costs: Total	Overhead and other costs[2]	Total costs
51-S Patenwell	4,617	275	84	$825.00	$476.00	$311.81	$787.81	$110.00	$1,722.81
52-S Arbutus Lake	5,043	132	36	396.00	153.40	76.70	230.10	51.60	677.70
53-S Riverside	1,269	0	26	0	177.01	51.65	228.66	0	228.66
54-S Smith Lake	3,823	30	54	90.00	320.77	125.05	445.82	36.00	571.82
56-S Connor's Lake	4,317	0	24	0	119.00	51.60	170.60	0	170.60
57-S Lacum	3,085	5	116	15.00	533.40	171.60	705.00	2.00	722.00
58-S Morgan Lake	2,773	36	87	108.00	388.00	150.25	538.25	14.40	660.65
74-S Crystall Lake	3,569	166	88	498.00	436.30	150.70	587.00	66.40	1,151.40
75-S Blue Lake	2,570	72	106	216.00	544.15	154.12	698.27	86.40	1,000.67
77-S Colon Springs	903	0	84	0	437.53	145.56	582.89	0	582.89
78-S Mercer	5,256	132	82	396.00	114.08	61.23	175.31	31.68	602.98
89-S Unson	0	0	29	0	146.76	37.45	184.21	0	184.21
90-S Dunbar	1,257	24	34	72.00	119.00	50.00	169.00	9.60	250.60
91-S Elsho	1,363	0	108	0	518.25	200.00	718.25	0	718.25
96-S Fairchild	3,779	90	96	270.00	494.23	201.60	695.83	36.00	1,001.83
Total	40,857	962	964	$2,886.00	$4,777.49	$1,909.56	$6,687.05	$446.68	$10,019.73

1 Based on $3.00 per man-day C.C.C. labor.

2 Based on a prorated charge of $0.40 per C.C.C. man-day.

Cost figures contained in this report are as nearly correct as can be determined at this time. They are subject to change when final figures are received from the Conservation Department.

Table 10.- Pre-eradication Survey, Fall Work, 1936

Unit	Acres white pine	Acres planting sites	Acres to cut Scout	Crew	Total	Man-days labor required
Argonne	1,396	950	1,080	1,284	1,764	1,900
Oconto		1,440	1,875	1,440	1,317	2,880
Chequamegon	20	1,120	1,640	420	2,200	840
Flambeau	40	60	205	80	285	120
Menominee	—	230	197	106	293	110
Total	1,456	3,800	5,040	3,330	5,859	5,850

Pre-eradication surveys in preparation for the 1936 fall season were performed on two Indian Reservations, viz., the Menominee and the Lac Courtilles.

On the Lac Courte Oreilles Indian Reservation a pre-eradication survey was made on C.C.C. funds administered by the U. S. Indian Service. In this survey there were found 6,200 acres of good white pine stands, mature, approximately 4,200 acres were classed as Pines free and 1,000 acres will require crew work. Approximately 1,600 acres of the 6,200 acres of white pine on the reservation belong to white citizens of Hayward and for this reason a cooperative arrangement is now being planned for 1937 between the U. S. Indian Service and the Division of Blister Rust Control whereby supervision of control work will be furnished through the W.P.A. and the Indian Service through the C.C.C. will furnish the labor for the actual eradication work.

On the Menominee Indian Reservation pre-eradication surveys on areas to be worked in 1936 were accomplished as follows:

Acres of white pine pre-surveyed - - - - - - - - - - - - - - - - 9,000
Acres to be worked by crew - - - - - - - - - - - - - - - - - - 4,865
Acres to be worked by scout - - - - - - - - - - - - - - - - - - 1,135
Total acres to be worked - 6,000
Man-days required, crew work - - - - - - - - - - - - - - - - - 4,040
Man-days required, scout work - - - - - - - - - - - - - - - - - 800
Total man-days labor required - - - - - - - - - - - - - - - - - 4,840
Cost of making pre-survey - - - - - - - - - - - - - - - - - - - $225.25
Total acres immature white pine on reservation - - - - - - - - 30,000
Acres white pine protected 1935 - - - - - - - - - - - - - - - 2,370
Acres white pine protected 1936 - - - - - - - - - - - - - - - 400
Acres white pine protected 1935 - - - - - - - - - - - - - - - 4,000
Acres white pine remaining to be initially protected - - - - - 23,230
Acres white pine pre-surveyed, 1936 - - - - - - - - - - - - - 9,000
Acres remaining to be pre-surveyed - - - - - - - - - - - - - - 13,230

-oOo-

In Table 62 is shown the pre-eradication survey work accomplished by the U.S.F.S. crews to December 31, 1953.

Table 62.- Pre-eradication Survey, U.S.F.S., Wisconsin

County	No. townships covered	Acres white pine mapped	Acres scattered pine mapped	Total acres pine mapped
Ashland	4	168	712	880
Chippewa	7	866	231	897
Dane	2	1,084	336	1,417
Marathon	10	2,728	4,287	6,015
Monroe	4	1,035	2,079	3,000
Outagamie [1]	19	691	657	1,348
Portage	7	2,160	2,157	4,017
Sheboygan	10	633	157	790
Washburn	8	130	450	580
Waupaca	4	579	251	827
Total	74	9,404	11,460	20,864

1 Completed

The pre-eradication surveys performed by the W.C.A. Agents are not shown separately but are included in the various pre-eradication survey figures already shown. The pre-eradication survey work by all agencies is being conducted in the winter of 1954. It is planned to conduct this work until the entire state is completed.

Complete county-wide pre-eradication surveys were made in Barron, Douglas, Juneau, Langlade, Outagamie and Polk Counties.

Pre-eradication surveys are now in progress by the different agencies in 21 counties.

Local Control

Local control in 1954 in Wisconsin was performed by Welfare Relief Labor, by W.C.A., State E.C.W., Forest Service E.C.W., and Indian Service E.C.W.

Relief Labor.

The following description of the use of relief labor in Door County is quoted from the Wisconsin Annual Report for 1933, prepared by T. F. Rooks:

"Use of Relief Labor in Door County

"When eradication work began in Door county early in the spring of 1933 as soon as the sites hazard were located out, and it continued for approximately six weeks. This project materialized as a result of the white pine pre-eradication survey which has been conducted in the county during the winter of 1932-1933. The cooperative plan used in Door county was somewhat different from that used in any other county of the state where work had previously been carried on. Therefore, the policy had been for each pine owner to furnish the labor needed for eradication work on his property and for the state or county to furnish the supervision. Instead, Door county through its county board, assigned a group of men from the county relief list to assist the pine owners with the work. The state furnished the supervision. Due to the geographic shape of the county, which is sixty miles long and ten miles wide, it was divided into three sections - north, central and south section. The relief men were assigned to the section in which they lived so that they would be reasonably near their work. The men were paid the wage established into groups of six men each, with five of the men in line and the sixth used as a checker behind the line. The southern section of the county was the largest, having an average of 30 men, or five crews, per day. All of these relief workers were trained for six days in a Door county woodlot, and during the training period the most responsible men were selected for "straw-bosses". The three blister rust foremen, each of whom was in charge of a section, maintained close supervision of the eradication crews. The crew men were employed solely by the county. They worked by the hour at twenty cents per hour. One-quarter of their salary was paid them in cash, and three-quarters was reserved for future credit for necessities for them and their dependents. Half of the funds came from the State through the Industrial Commission and half from the county. These men worked a ten-hour day, exclusive of travel time to and from work. The system proved to be highly successful as more than one-half of the white pine acreage in Door county was protected during the brief period of work. As soon as emergency relief projects developed to the point where the agencies paid their men entirely in cash and at a higher rate, the blister rust crew work was discontinued and the men worked on other projects."

State C.C.W.

Blister rust control work was done out of 12 State C.C.W. camps. Ten blister rust foremen were hired. The region was divided into four districts with a checker giving general supervision to the work in each district. The names of the checkers and their camp assignments were as follows:

[illegible] assigned to camps [illegible]
[illegible] assigned to camps [illegible]
[illegible] assigned to camps [illegible]
Charles L. Lee assigned to camps [illegible]

Groups of men ranging in numbers from 10 to 21 were assigned by camp superintendents to Blister rust-eradication work in the State C.C.C. camps. These groups were subdivided into crews of six men each -- five men in line and a screenman behind the line. The blister rust foremen supervised these crews of men in the field.

A field training school was held for foremen and members at the beginning of the eradication season. They entered the camps as laborers and worked in that capacity for a time and then acted as straw-boss during rains. Training was given in the matter of making reports and maps. At the close of this field training work they were relieved of the duties assigned to a specific camp and trained for complete supervision of blister rust work at the camp. The more alert and able of these men were assigned the positions of checkers.

Blister rust foremen and checkers in the different C.C.C. camps spent a certain proportion of their time fighting forest fires during the Ribes eradication season. Out of an approximate total of 6th man-days spent in C.C.C. work by the 10 foremen and four checkers, 183 man-days or nearly 20 percent were spent on fire suppression duties.

Forest Service C.C.C.

Control work on the Modoc National Forest was chiefly concerned with the protection of white pine planting sites. The work was under the direct supervision of Maynard M. Maxwell, C.C.C. Inspector, employed by C.C.C. funds through the Bureau of Plant Industry. In August 1935 Mr. Maxwell was hired on Forest Service C.C.C. funds to work on the various Forest Service units.

The 4-man crew was usually used in Ribes eradication work on U. S. Forest Service lands for a longer period each year on account of the Ribes eradication work was performed similarly to that done on the State C.C.C. projects. The actual supervision of the Ribes eradication crew was performed by a technical foreman from the camp assigned to such work.

Indian Service C.C.C.

Control work by means of C.C.C. funds, labor was performed on two Indian reservations, viz., the Menominee and the Lac du Flambeau.

On the Menominee Indian Reservation control work started late. On July 8, the project manager, C. M. Clasby, and four checkers, the only white men employed on the project, started work making preeradication

survey for areas to be protected in 1937. On July 17 approximately 100 Indians started work. No camp was established for them and instead they were transported between their homes and the work by truck.

This group of Indians was divided into eight crews, each crew consisting of 12 men. Two crews were worked in the front line, two strip-cleared zig-zagged back and forth behind the line and the Indian foreman and was directly in charge of the entire crew climbed behind the strip-cleaners. The work established on the reservation during the entire field season was of a high caliber, indicating that the size of crew and method of handling the men were satisfactory. The Lac du Flambeau Indians displayed remarkable enthusiasm for the work and they were unusually alert in locating fires hushes. Their feeling in general toward the work was that they were protecting their own trees. Their interest did not lag as time went on.

Control work on the Lac du Flambeau Indian Reservation began late in the season under the supervision of W. D. Harris. A large portion of the white pine growing area on this project is of a sandy soil type. Here fires, except along streams, lake shores and in the tag alder swamps. It was possible to furnish initial protection to all of the white pine stands known on the reservation. The Indians were installed in 17-man crews as on the Menominee Reservation. Mr. Harris was the only white man employed on blister rust control. The Lac du Flambeau Indians liked the work and performed thorough and satisfactory work.

In Tables 57 and 58 are shown statements and costs of total crews in Wisconsin 1937. It may be noted that 21,479 acres of white pine and 1,366 acres of white pine planting sites were protected by removing 4,022,842 ribes from 52,980 acres at a total cost of $4,060 man-days labor and 1,253 man-days supervision. Throughout the entire region the average of four acres was worked per man-day at a cost of $0.78 per acre. The number of ribes per acre worked averaged 69.

In Table 59 the figures shown in Table 57 are shown as percent and other derived figures.

In Table 60 it may be noted that the number of crew workers to protect one acre of white pine varied from 1 to 4.2 with an average of 2.4. The size of the pine area protected is the chief factor affecting the size of crew required to be worked. Naturally, the smaller the area of white pine being protected the larger proportionately must be the total area worked to the area protected.

Approximately one-third of the total area worked in Wisconsin is covered by crew and two-thirds by the scout methods.

Ribes pulled per acre of crew work averaged nearly 210 per acre, while those pulled on the area scouted averaged 0.3 bush per acre.

Camp Lo. or Location	Type	Capacity	Occupancy	Days Open	Total Man-Days Available	Total Man-Days Used	Average Daily Census	Percent Occupancy	Total Cost	Cost per Man-Day Available	Cost per Man-Day Used
Fish Camps											
Federal Camps											
41-C1 Redwood Lk.	Fed.	1,000	1,000	1,000	1,000,000	1,000,000	1,000	100	$ 1,000,000	$ 1.00	$ 1.00
42-C1 Little Lake	Fed.	6,500	0	12,600	12,600	0	0	0	0	0	0
43-C1 Pineville	Fed.	200	1,000	365	3,100	310,000	1,000	100	310,000	100.00	100.00
44-C1 North Lake	Fed.	1,000	1,000	180	1,750	0	180	100	0	0	0
45-C1 Canyon Lake	Fed.	240	240	0	240	240,000	240	100	240,000	1,000.00	1,000.00
46-C1 Smith	Fed.	200	50	0	50	4,000	50	25	4,000	80.00	80.00
47-C1 Hidden Lake	Fed.	200	180	200	700	126,000	180	90	126,000	180.00	180.00
48-C1 Sequoia Lake	Fed.	240	0	240	240	0	0	0	0	0	0
49-C1 Deer Lk.	Fed.	400	200	1,000	1,750	60,000	200	50	60,000	300.00	300.00
50-C1 Bear Lk.	Fed.	50	50	365	365	18,250	50	100	18,250	365.00	365.00
51-C1 Canyon	Fed.	1,000	600	365	3,650	219,000	600	60	219,000	365.00	365.00
52-C1 Creek	Fed.	100	100	730	1,000	24,000	100	100	24,000	240.00	240.00
53-C1 Timberlin	Fed.	50	100	90	900	135,000	100	200	135,000	1,500.00	1,500.00
Regional		150	100	365	365	36,500	100	67	36,500	100.00	100.00
Private	400	0	200	90	360	80,000	222	56	80,000	222.22	360.00
Commercial	500	0	150	365	365	54,750	150	30	54,750	150.00	150.00
Fishing	200	0	127	90	360	45,720	127	64	45,720	127.00	127.00
Summary		1,100	1,100	1,200	1,000	1,111,000	1,000	91	1,111,000	1,111.00	1,111.00
Net Total		2,775	2,600	2,000	2,000	1,111,000	2,000	72	1,111,000	555.50	555.50

1. Excludes $85.00 for agreements.
2. Transportation furnished by county.
   Labor camps, welfare relief, paid by Lake County, $5.00 per month (Federal
   Parks 1-7-2. Labor charged at $5.00 per month over $5.00 per month.
   Summer Service 7-8-9. Labor charged at $1.50 per man-day.
   Indian camps 8-2-0. Labor charged at $8.30 per man-day.

Table 53.- Acres White Pine Protected. Classified according to Counties. Wisconsin, 1933.

County	Agency	Acres protected: W. P. planting site	Acres protected: White pine	Acres worked	Ribes pulled	Man-days: Labor	Man-days: Supervision
Adams	W.E.C.W.	0	61	259	0	0	1
Ashland	F.S.-E.C.W.	560	0	643	45,347	205	13
Bayfield	W.E.C.W.	0	282	1,142	37,827	293	14
Burnett	W.E.C.W.	0	465	2,179	121,740	740	26
Door	Welfare	0	981	4,157	561,766	1,224	60
Clark	W.E.C.W.	0	47	279	24,596	246	13
Douglas	W.E.C.W.	0	40	455	320,102	815	27
Douglas	W.R.A.	0	504	525	642,579	1,040	137
Eau Claire	W.E.C.W.	0	33	261	93,876	628	31
Forest	F.S.-E.C.W.	0	145	495	71,591	469½	30
Jackson	W.E.C.W.	0	3,725	12,496	204	104	12
Juneau	W.E.C.W.	0	746	4,686	41,041	471	29
Langlade	W.E.C.W.	0	355	1,072	54,793	502	32
Marinette	W.E.C.W.	0	260	790	127,503	793	39
Oconto	I.S.-E.C.W.	0	1,461	2,466	862,961	2,113	221
Oconto	F.S.-E.C.W.	120	0	284	20,869	160½	13
Oneida	W.E.C.W.	0	496	1,758	48,027	545	37
Price	F.S.-E.C.W.	856	0	920	68,681	521	53
Sawyer	W.E.C.W.	0	1,557	3,154	260,904	1,161	84
Shawano	I.S.-E.C.W.	0	2,625	4,629	462,328	1,337	305
Vilas	I.S.-E.C.W.	0	3,773	8,352	248,702	660	61
Vilas	W.E.C.W.	0	3,768	6,786	90,177	450	47
Wood	W.E.C.W.	0	155	793	16,728	149	8
Total		1,536	21,679	58,300	4,021,582	14,654	1,281

Table 59.- Ribes Pulled and Costs per Acre, Local Control, Wisconsin, 1933.

Agency	Acres worked to protect one acre white pine	Percent total area worked covered by crew	Ribes pulled per acre			Acres worked per man-day			Cost per acre	
			Crew	Scout	Total	Crew	Scout	Total	Worked	Pine protected
Private	4.2	75.0	115.7	0	87.0	2.6	114.4	3.4	$0.68	$2.86
N.R.A.	1.0	100.0	1,224.0	0	1,224.0	.5	0	.5	8.82	9.19
State E.C.W.	3.0	26.7	128.2	0.1	34.3	1.4	109.4	5.2	.64	1.92
F.S.- E.C.W.	1.4	40.7	216.7	0	88.2	.7	138.9	1.7	1.11	1.55
I.S.- E.C.W.	2.0	31.8	313.7	.9	101.9	1.2	73.2	3.7	.82	1.60
Total	1.4	58.7	349.4	.2	68.7	1.3	98.9	4.0	.70	1.40

An average of 1.2 acres of area work was completed per man-day. An average of 96 acres was worked per scout-day, making an average of four acres of all work per man-day.

The average cost per acre worked was $0.78 and per acre of pine protected $1.99. One of the chief factors affecting the cost per acre was the cost of labor per man-day. In each of the E.C.W. agencies the per man-day costs were those used by the agency in figuring out the costs of other projects. The cost figures we have used in this report are the same as those used by the various agencies.

Table 60.- Acres of White Pine Stands Protected Classified by Ownership Classes, Wisconsin, 1935

Agency	Ownership classes: Private	Municipal	County	State forests	Forest Service	Indian Service	Total	Percent
State Welfare	981						981	4.1
N.R.A.	440	64					504	2.1
State ECW	8,682	910	2,398				11,990	49.1
F.S.-S.C.W.					1,601		1,601	7.3
I.S.-S.C.W.						7,859	7,859	34.1
Total	10,103	974	2,398		1,601	7,859	23,935	
Percent	43.9	0.3	4.0	10.4	7.3	34.1		100

Status of Local Control, Wisconsin, December 31, 1935

Acres good white pine	437,945
Acres scattered white pine	268,570
Acres white pine initially protected (1910-35)	44,608
Good white pine initially protected, percent	9.1
Total acres white pine initially protected, percent	5.9

Checking

Systematic checking was performed on all White eradication work done in Wisconsin and showed that the great majority of the work done was entirely acceptable and came under the established maximum of 25 feet of live stock per acre. In Table 62 is shown the results of checking on all the work done in Wisconsin.

Table 61.- Summary by Years of Ribes Eradication Work, Wisconsin, 1918 to 1933, Inclusive.

Year	Acres worked			Ribes pulled	Cost	Per acre		Cost per bush, cents
	Initial	Second	Total			Cost	Ribes	
1918	220	0	220	24,000	$500.00	$2.27	109.1	2.08
1919	75	0	75	5,844	138.59	1.85	77.9	2.37
1920	10,995	0	10,995	775,576	5,708.24	.52	70.5	.74
1921	8,887	0	8,887	457,093	3,620.84	.41	51.4	.79
1922	4,770	0	4,770	530,958	3,007.94	.63	111.3	.57
1923	3,337	10	3,347	204,043	2,671.98	.80	61.0	1.31
1924								
1925								
1926	58	150	208	51,878	700.00	3.37	249.4	1.35
1927	200	50	250	42,226	1,112.24	4.45	168.9	2.63
1928	347	0	347	79,861	1,045.85	3.01	230.1	1.31
1929	120	60	180	18,744	771.05	4.28	104.1	4.11
1930	491	0	491	164,485	969.10	1.97	335.0	.59
1931	3,387	580	3,967	313,839	1,999.03	.50	79.1	.64
1932	18,457	0	18,457	1,350,227	6,079.12	.33	73.2	.45
1933	58,580	0	58,580	4,022,342	45,690.46	.78	68.6	1.13
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 62.- Results of Checking, Wisconsin, 1933.

Agency	Camp or location	Ribes type	Acres worked Crew- C Scout-S	Ribes pulled per acre	Acres checked	Ribes per acre after eradication Bushes	F.L.S.	F.L.S. per Bush
State E.C.W.	All camps	A	1,347 C	382	?	10.8	12.6	1.1
		C	1,728 C	23	?	2.5	13.8	5.5
		D	2,587 C	9	?	3.0	11.6	3.8
Sub-total			5,662 C	104	?	4.0	12.6	3.1
F.S.- E.C.W.								
Argonne	Nine Mile Camp	A-C	40 C	841	2.0	4.0	10.0	2.5
Argonne	Virgin Lake Camp	C	340 C	112	2.0	1.5	11.0	7.3
Oconto	Mountain Camp	C	122 C	58	2.6	6.2	14.5	2.4
Oconto	Mountain Camp	C	80 C	172	1.5	9.3	33.3	3.6
Chequamegon	Block 1	A-C	71 C	59	2.0	5.0	17.5	3.5
Chequamegon	Block 3	A-C	73 C	564	4.0	1.5	4.0	2.7
Flambeau	Block 2	A-C	94 C	471	2.0	0	0	0
Flambeau	Block 4	A-C	70 C	117	3.0	3.7	7.6	2.1
Flambeau	Block 5	A-C	63 C	257	5.0	1.0	3.0	3.0
Sub-total			958 C	217	24.1	4.0	9.1	2.3
I.S.- E.C.W.	Strip B	C	104 C	496	3.2	4.4	7.7	1.8
Red Lake Indian Reservation	Plot 14	C	80 C	99	1.6	8.1	19.0	2.3
	Plot 3A	A-C	216 C	48	5.0	11.0	12.4	1.1
	Plot 9	C	41 C	171	1.32	3.7	19.5	5.3
	Plot 13	C	110 C	473	1.76	13.6	24.4	1.8
	Plot 7	C	122 C	764	?	?	21.0	-
	Plot 4A	A-C	126 C	359	2.0	9.0	9.5	1.1
	Plot 6	C	129 C	573	4.64	12.3	14.6	1.2
	Plot 12	C	125 C	486	2.8	13.9	23.5	1.7
	Plot 9A	C	855 C	56	6.6	8.1	7.5	.9
	Plot 10	C	164 C	642	3.34	4.1	8.4	2.4
	Plot 16	C	183 C	88	3.0	9.6	18.1	1.9
	Plot 6A	C	157 C	204	1.8	6.6	7.7	1.8
	Plot 3	A-C	100 C	759	3.28	6.7	18.6	2.8
	Plot 10A	A-C	295 C	503	8.5	8.6	14.6	1.7
	Plot 4	A-C	132 C	1,036	3.94	9.0	18.7	2.1
	Plot 2A	C	107 C	219	3.0	4.6	3.8	.8
	Plot 1	C	60 C	961	2.02	7.0	9.3	1.3
	Plot 6	C	63 C	63	1.6	5.6	13.1	2.3
	Plot 5	A-C	93 C	766	1.8	12.2	18.9	1.5
	Plot 2	C	60 C	522	1.8	3.3	2.8	.9
	Plot 1A	C	50 C	139	2.5	5.6	4.4	.8
	Plot 5A	A-C	217 C	246	3.0	3.0	11.0	3.7
Sub-total			2,582 C	687	66.6	8.1	12.3	1.5

Table 62.- Results of Checking, Wisconsin, 1933 (Continued).

Agency	Camp or location	Ribes type	Acres worked Crew- C Scout-S	Ribes pulled per acre	Acres checked	Ribes per acre after eradication: Bushes	F.L.S.	F.L.S. per bush
I.S.- E.C.W.	Tract 1	D	455 S	0	2.0	0	0	0
Lac du Flam-	Tract 2	D	322 S	0	2.0	0	0	0
beau Indian	Tract 3	D	420 S	0	2.0	0	0	0
Reservation	Tract 4	D	335 S	0	2.0	0	0	0
	Tract 5	A	170 C	585				
		D	345 S	0	11.0	3.0	15.0	5.0
	Tract 6	D	205 S	0	2.0	0	0	0
	Tract 7	D	200 S	0	2.0	0	0	0
	Tract 8	A	60 C	124				
		D	1,320 S	0	2.0	2.0	8.5	4.2
	Tract 9	D	210 S	0	2.0	0	0	0
	Tract 10	D	265 S	0	2.0	0	0	0
	Tract 11	D	295 S	0	2.0	0	0	0
	Tract 12	D	300 S	0	2.0	0	0	0
	Tract 13	D	290 S	0	2.0	0	0	0
	Tract 14	D	170 S	0	2.0	0	0	0
	Tract 15	A	790 C	142				
		D	680 S	0	20.0	3.0	9.0	3.0
	Tract 16	A	230 C	87	10.0	2.0	8.0	4.0
	Tract 17	A	70 C	142				
		D	210 S	0	5.0	6.0	18.0	3.0
	Tract 18	D	320 S	0	2.0	0	0	0
	Tract 19	D	310 S	0	2.0	0	0	0
	Tract 20	D	380 S	0	2.0	0	0	0
Sub-total		A	3,820 C	124				
		D	7,042 S	0				
			6,062	20	75.0	1.7	7.3	

Data are not at hand to show the results of checks of actual areas in the state C.C.C. camps. However, checks of other individual areas are shown and it may be noted that with only one or two exceptions the areas worked were entirely satisfactory.

In Table 53 the checking figures for the Menominee Indian Reservation have been analyzed to see what relationship, if any, exists between abundance of Ribes prior to eradication and abundance of Ribes remaining after eradication. It is apparent that there is very little correlation, if any. Areas on which the Ribes averaged 71 per acre before eradication showed more Ribes per acre after eradication than areas averaging 961 Ribes per acre before eradication.

Checking figures indicate that an efficient Ribes eradication crew will pull Ribes down to an average of from 10 to 20 feet of live stem per acre, regardless of the concentration of Ribes prior to eradication.

On the areas checked two Ribes types were predominately worked by crews - Type A, live swamp type, and Type C, hardwoods type. Results of checking show very little difference in the Ribes content left after eradication on these two Ribes types.

Table 53.- Analysis of Checking Figures, Menominee Indian Reservation, Wisconsin, 1933

Ribes pulled per acre class	No. areas	Simple average Ribes pulled per acre	Simple average Ribes per acre after eradication: Bushes	[illegible]
1-100	5	71	6.6	14.0
101-200	2	155	4.7	12.0
201-300	3	225	4.7	7.0
301-400	1	359	9.0	8.6
401-500	3	486	7.8	15.6
601-800	3	638	8.1	10.7
601-700	1	642	4.1	8.0
701-900	3	783	9.8	19.6
801-900	-	-	-	-
901-1000	1	961	7.0	9.3
1001-1100	1	1,056	9.0	14.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 64.- Nursery Sanitation Work Performed, Wisconsin, 1933.

Name	Ownership	Program	Acres protected in nursery	Acres worked			Cult. black currants	Other cult. Ribes	Wild Ribes	Ribes pulled, Total	Times worked and remarks
				Crew	Scout	Total					
Rhinelander	Forest Serv.	F.S.-E.C.W.	30.0	190	60	250	0	0	322	322	3d
Nepco.	Private	State ECW	2.5	0	113	113	0	0	2	2	3d
Wis. Rapids	State	State ECW	1.0	166	0	166	0	0	534	534	2d
Goodman	Private	State ECW	2.5	139	49	188	0	0	104,803	104,803	1st
Total			36.0	495	222	717	0	0	105,661	105,661	

Table 65.- Costs of Nursery Sanitation, Wisconsin, 1933.

Name	Man-days labor			Man-days supervision			Costs				
							Labor		Supervision		
	F.S.-E.C.W.	State E.C.W.	Total	F.S.-E.C.W.	State E.C.W.	Total	F.S.-E.C.W.	State E.C.W.	F.S.-E.C.W.	State E.C.W.	Total
Rhinelander	29	0	29	5	0	5	$43.50	0	$35.40	0	$78.90
Nepco.	0	0	0	0	1	1	0	0	0	$3.00	$3.00
Wis. Rapids	0	10	10	0	1	1	0	$30.42	0	4.00	$34.42
Goodman	0	663	663	0	30	30	0	1,989.00	0	218.00	2,207.00
Total	29	673	702	5	32	37	$43.50	$2019.42	$35.40	$225.00	$2,323.32

Table 44. Summary, Forestry [illegible] 1987 to 1987

Name and location Forest--Date/Private	Area affected Acres	Type	Year worked	Acres worked	Area public Diff.	Area public Cost	Costs Hours worked	Hours Planned to Def	Hours Travel	Other	Total	Remarks
Coleraine; Chief- tenden Forest Service	50.0	Ins Fo Ad	1981 1982 1985	400 40? 450	0 0 0	$ 0.00 2.50 0.00	0	0	$24.00 15.00 0	$36.50 100.00 0	- $36.50 200.00 0.00	
Coleraine Public Conservation Depu- ties Fairs Service	5.0	Ins Ad	1981 1982	150 800	0 0	40.50 75.00	0 0	0 30.00	0 100.00	200.00 80.00	Fire collection issued in 1981 records lost. In 1987 grants cost including $32.00 from Forestry Dir.	
Grand Lake; Forest Lake; State	30.0	Ins Fo	1981 1982	800 450	0 0	8.00 ? 00	0 0	0.00 55.00	0 0	36.50 40.00	Conservation department funds.	
Grenville Survey; Grenville Section; Dare	1.0	Ins Fo	1982 1985	200 100	0 0	0.00 0.00	0 0	0 0	0 0	0 84.50	Not real done by there owners.	
Hayco.; Maronite Border Private	2.0	Ins Ad Fo	1981 1982 1985	50 100 ??	0 0 0	0 0 0	0 0 0	0.00 0 0	11.05 0 0	12.00 0 0.00	Work real done by there boards.	
Hudson Lumber Co.; Dresden; Private	2.0	Ins	1983	100	0	104.50	0	0	0	0	2,207.00	Fire infection found state line 1983.
Relay; Hendrickson Parishes; Private	30.0	Ins	1981	400	0?	1.00	0	0	180.00	130.00	200.00	Information incomplete, estimated.

Nursery Sanitation

Nursery sanitation was performed around two Forest Service, one state and two private nurseries in Wisconsin in 1933. The work done and costs are shown in Tables 64 and 65 and the summary of all nursery sanitation work to date in Wisconsin is shown in Table 66.

Investigational Activities

Investigative work in Wisconsin concerned the study of:

(1) Susceptibility of the Alpine currant, R. alpinum, in the field, started in 1932.

(2) The relative susceptibility of Pinus nepos, P. monticola and P. strobus.

(3) Experimental chemical eradication conducted by George Draper from the Spokane office, and

(4) The study of infection conditions on the Menominee Indian Reservation conducted by H. G. Hasman.

The report of work done along these lines is quoted in full from the Wisconsin Annual Report for 1933, prepared by T. F. Knuth.

"Investigative work with Alpine currants, R. alpinum L., to determine the susceptibility of this Ribes species to white pine blister rust under field conditions in Wisconsin, was begun in the spring of 1932 and was continued during 1933. Six alpine currants were planted in an extremely heavy blister rust infection-center in Shawano county. These currants have the reputation of being highly resistant to blister rust. The bushes were planted under extremely favorable conditions for them to contract this disease. Many pine cankers fruited nearby, some of the cankers within a few feet of the bushes. Dozens of Ribes cynosbati bushes grew in the immediate vicinity and were used as check plants.

"Observations were made on these Ribes alpinum on several occasions throughout the late spring and summer of 1933, but again, as in 1932, no infection was seen on any of the bushes. The Ribes cynosbati carried an extremely heavy infection, however. Since the work progressed for only two seasons the results obtained cannot be taken as conclusive. The study indicated that it is safe to assume that Ribes alpinum is less susceptible to Cronartium ribicola than many of the other Ribes species found within the state.

"This susceptibility plot came to an abrupt end when a Menominee Indian Ribes eradication crew covered that area during early autumn and removed the bushes.

"Pinus Peuce Griseb., commonly called the Macedonian pine, is a five-leafed pine considered by some foresters highly resistant to the white pine blister rust. To determine whether this pine is or is not subject to blister rust under field conditions in Wisconsin fifty of

these Pinus Peuce were planted in a heavy blister rust infection-center on the Menominee Indian Reservation last spring. In order that relative comparisons of infections on other white pines may be made at the same time some fifty Pinus monticola D. Don., the western white pine, and fifty Pinus Strobus L., the northern white pine, were planted in the area as check plants. It will be at least two years before infection can become visible on these pines, consequently no statement concerning results can be made at this time.

"Experimental Chemical Eradication

"To test the desirability of using chemicals for Ribes eradication work, an experiment was conducted during 1932 on the Menominee Indian Reservation by the United States Department of Agriculture.

'Summary of Ribes Experiments Performed At Shawano and Keshena, Wisconsin in 1932.

'During the months of July and August 1932, plans were formulated jointly by Mr. S. B. Detwiler and Mr. F. C. Meier for a field experiment with chemicals on Wisconsin Ribes. The work was conducted by G. E. Draper with the assistance of H. N. Putnam, Supervisor of the Lake States region and T. F. Koube, State Leader for Wisconsin. Four unskilled laborers were employed for the spraying job.

'The purpose of the experiment was to test in a preliminary fashion the effectiveness of sodium chlorate and ammonium thiocyanate on Wisconsin Ribes when such chemicals were applied according to best known field practice. On the basis of claims set forth by its manufacturers, a claim chloron, a proprietary weed killer, was subsequently included in the list of chemicals to be tested. While it was recognized that application of these chemicals by an inexperienced crew on a relatively small scale would not provide adequate basis for comparing the cost of chemical and hand work it was considered desirable to keep cost records of the experiment for future reference.

'With these objectives in mind, Messrs. Putnam and Koube located several areas at Shawano and Keshena, Wisconsin to be used for the experiments.

'Description of Plots and Method of Treatment.

'Area I was located north of Shawano on the Menominee Indian Reservation. The area was typical swamp land containing a number of patches of R. glandulosum and a few scattered bushes of R. cynosbati. All applications of chemicals to Area I were made by means of the compressed spray unit developed by the Western Office of the Division of Blister Rust Control. The men were given preliminary instructions and a practical demonstration

in its use. Each crew man then applied 6 gallons of the 11 percent sodium chlorate solution to a small area of R. glandulosum thus acquainting him with the use of spraying equipment as well as the characteristics of the Ribes.

'Area I had previously been staked off and laid out into parallel lanes 6 to 8 feet wide by means of string. Each lane was then carefully worked by one man followed by a checker. A checker supervised the work of two crew men. It should be noted that R. glandulosum was fast becoming dormant and that a large share of the leaves had already fallen. A few R. cynosbati that were found on this area were also sprayed.

'Area III was located three or four hundred yards away from Area I in the same wood-lot. Boundaries of this area were marked by blazed trees. These plots contained only R. cynosbati which were treated with solid calcium chloron. String lines were not laid down because the bushes were easily found and the white color of calcium chloron made it easy to tell which bushes had been treated. The dry chemical was carried in 5-quart pails and was ladled out with 6-inch frying pans. The men covered the area in strips walking four abreast and four to six feet apart. The writer checked behind them to catch missed bushes and to take a count of the number of bushes treated.

'In the use of calcium chloron, considerable annoyance was experienced by the workers by reason of the fine powdery nature of the compound. The dust which came into contact with the moist mucuous membranes of the nose and throat was very irritating.

'Area IV was located 16 miles northwest of Neshena, Wisconsin. This region had been logged about 1913 and burned over shortly thereafter. The land, covered quite thickly with brush and young trees, was quite wet and was bordered on the north side by a shallow creek. The area was marked off into chain square plots which were subsequently divided into 6 to 8 foot lanes by means of string lines. Two men were assigned to each lane. The first one was equipped with a knapsack unit having the extension rod and spray nozzle replaced by a one-fourth inch gas pipe fitted with a pointed steel tip in which a small hole was bored. Each bush was given a subsurface drench by running the prod just under the surface of forest litter or soil. Each hole was given one to three strokes of the pump depending on the size of the bush. Each bush received one or more prods immediately around the crown and a series of prods four to six inches from the crown. The number of holes used depended on the size of the bush. The second man followed with a knapsack spray unit, and covered each bush with a mist spray. A checker was employed to supervise the work of each two-man crew. Data covering the experiments are given in Tables No. 1, 2 and 3.

Table No. 1

Summary of Spraying Experiments on Ribes Performed at Shawano and Keshena, Wisconsin in 1932.

Location	Size of Plot Square Acres	Date of Application	Chemical Used	Concentration in Lbs. per Gallon	Quantity of Chemical Applied	Total Feet of Live Stem or Total Number of Bushes Treated	Method of Application	Time Consumed Man Hours
Area I 2E (1-4)S	0.4	8/23/32	Sodium chlorate*	1	78 gals	2,725 F.L.S.	Spray: ground & stems	16½
Area I 1E (1-4)S	0.4	8/23/32	Ammonium thiocyanate	1	32 gals	1,300 F.L.S.	do	9 3/4
Area II Practice Plot Approximately 1 Chain Sq.		8/22/32	Sodium chlorate*	1	32 gals	No record	do	No record
Area III	0.45	8/22/32	Calcium chloron	Solid	300 lbs.	375 bushes	Crown application	3
Area IV Plots 1,2,3	0.3	8/24/32	Sodium chlorate*	1	105 gals	No record	Subsurface drench and aerial spray	20

*Glue 0.01 percent used as a sticker and spreader

Table No. 2

Cost Data for Experimental Eradication of Ribes at Shawano and Keshena, Wisconsin. Work Done in August, 1932.

Location	Chemical Used	Quan. Applied (a) Gals. and(or) Lbs. Per Plot	Gals. and(or) Lbs. Per Acre	Cost of Chemical Per Lb.	Cost of Chemical Per Acre	Man Hours of Labor per Acre Crewman (4)	Foreman (d) (2)	Cost of Labor (b) Per Acre Crew-men	Fore-men	Total Cost of Chemical and Labor per Acre
Area I 2E (1-4)S	Sodium chlorate	78	195	$.075	$14.63	41.3	20.6	8.26	16.58	39.47
Area I 1E (1-4)S	Ammonium thiocyanate	32	80	.075	6.00	24.4	12.2	4.88	9.82	20.70
Area III	Calcium chloron (c)	300	666	.07	46.62	6.7	3.3	1.34	2.66	50.71
Area IV	Sodium chlorate	105	350	.075	26.25	66.7	33.3	13.34	26.81	66.40

(a) Concentration of aqueous solution was one pound per gallon. Thus, figures for gallons per acre and pounds per acre are the same.

(b) Crew labor was figured at $0.20 per hour and the foremen at $0.91 and $0.70 per hour. These figures for foremen include subsistence allowance.

(c) A proprietary weed killer made by the New England Lime Co., Pittsfield, Mass.

(d) Two foremen were used, but with an experienced crew one should be sufficient.

'Table No. 3

Weather Notes at Shawano and Keshena, Wisconsin, 1932

Date	Soil Temperature Average	Air Temperature Average	Relative Humidity	Remarks
8/23/32	66	77	84	Light showers in early morning; afternoon lightly clouded, light breeze.
8/23/32	61	75	62	Clear, no breeze.
8/24/32	69	87	46	Part clouded, storm threatening.

'Tentative Observations on Merits of Chemical Work.

'The real value of these experiments will be determined most [illegible] when the plots are checked for percent of kill obtained with the different chemicals. In the meantime cost figures as given in Table No. 2 should be regarded with a wary eye. It is certain that costs of $39.58 and $66.56 for sodium chlorate treatment of Wisconsin Ribes can be reduced materially. As an example of what preliminary experiments mean in terms of later work the cost of the chemical destruction of R. petiolare in north Idaho might be quoted. At Clarkia, Idaho, in 1926 the eradication of R. petiolare with aqueous sodium chlorate cost $37.87 per acre; three years later the same sort of work was done for about $18 per acre. Certainly 10½ man hours of labor for the eradication of 2,725 feet of live stem as shown by Table No. 1 of this report can be improved upon. Furthermore the cost of chemical per 1,000 feet of live stem on the basis of data in Table No. 2 would be about $0.37. The cost of sodium chlorate per 1,000 feet of R. petiolare live stem as it is now applied in control operations in north Idaho is approximately 15¢.

'Should the results of these experiments show that a high degree of efficiency attends the use of chemicals on Wisconsin Ribes a thoroughly planned series of experiments should be undertaken to establish minimum dosage and technic of application. Until such a program of experimentation is complete comparisons of the cost of chemical and hand pulling methods are meaningless.

H. R. Offord
Agent

G. E. Draper
Agent.'

Results of 1932 Experiments Undertaken at Shawano, and Keshena, Wisconsin.
Work Done on August 22, 23, and 24, 1932

Plot Number	Chemical Used	Method of Application	Lbs. Per 100 Feet Live Stem	Gals. Per 100 Feet Live Stem	Ribes glandulosum Per Cent Stem Kill	Ribes glandulosum Per Cent Bush Kill	Ribes cynosbati Per Cent Stem Kill	Ribes cynosbati Per Cent Bush Kill
			Shawano, Wisconsin					
Area I, Plot 1E, 4S	Ammonium thiocyanate	Spray	3.0	3.0	97	**		
Area I, Plot 1E, 1S	do	do	1.9	1.9	85	**	100	100
Area I, Plot 1E, 2S	do	do	3.0	3.0	100	100		
Area I, Plot 1E 3S	do	do	2.8	2.8	98	**	100	100
Area I, Plot 2E, (1-4)S	do	do	2.9	2.9	99.8	**	100	100
			Keshena, Wisconsin					
Area III	Calcium chloron	Crown Appl. Solid Subsurface)	300# on 0.45 acre plot *				60	25
Area IV, Plot 1	Sodium chlorate	Drench and) Spray)	3.0	3.0			89	29
Area IV, Plot 2	do	do	2.6	2.6			90	28
Area IV, Plot 3	do	do	1.6	1.6			87	19

* Applied as a dry solid to the crown of each bush. This treatment does not represent uniform treatment of ground area.

** There is no record of the number of R. glandulosum treated. Nine R. cynosbati were treated on the three thiocynnate plots.

'A description of experiment objectives, plot location, method of treatment and cost record of the work has been presented under date of February 1, 1932 in report Serial #AE. The attached data were recorded by Draper in July 1933 and show the results of the 1932 tests.

'These experiments were planned and executed carefully enough to justify definite conclusions regarding the toxicity of thiocyanate to R. glandulosum. It appears that live stem kill depends upon the dosage applied and, on this basis alone, dosages of three pounds per 100 feet of live stem gave satisfactory results. The small number of R. cynosbati on the plots detracts somewhat from the significance of the results obtained for that species. It is interesting to note, however, that thiocyanate has proved more effective than chlorate on R. inerme (a gooseberry) when applied in equal doses in excess of 20 pounds per square rod. The apparent effectiveness of ammonium thiocyanate on R. cynosbati is further authenticated by the Idaho tests.

'The poor results obtained on R. cynosbati with sodium chlorate are substantiated by previous work in the far east.

'If future experiments are conducted, special care should be taken to ensure uniform application on a square rod basis of definite dosages of chemical. In the writer's opinion, thiocyanate merits further trial of R. grossularia.

'Owing to the dearth of information regarding the bush kill on R. glandulosum it is difficult to interpret results obtained by the thiocyanate treatment. The amount of live stem left on a given area following application of a definite dosage and the regenerative power of the surviving root centers are perhaps better criteria of the effectiveness of the work than the figures for live stem kill.

H. H. Offord,
Agent.'

"Data Taken on Pine Infections in T28N, R15E and T28N, R15E, on the Menominee Indian Reservation

"During August and September, 1933, H. J. Kinsman of the Division of Blister Rust Control, U. S. Department of Agriculture, was assigned the work of collecting infection data on the Menominee Indian Reservation. The object of this work was to get an unbiased report on the intensity of pine infections at various locations on the Reservation. Strip lines were run 13.2 feet wide, concerning which such pertinent data was recorded as the number of trees on each strip, number of infected trees, age of the infections, and the number of Ribes and the feet of live stem of the various Ribes species. For the aggregate of 87 miles of strip line there was a total of 1,161 white pines, and 1,164 were trees small enough to inspect. Fifty-eight of these inspected pines, or 4.98 percent, were infected with blister rust. Eighty-one visible cankers were seen. These cankers apparently had originated in the following years: 2 in 1927; 14 in 1928; 27 in 1929; 37 in 1930, and 10 in 1931. From this observation a conclusion was reached that about five percent of the pines became infected over a 5-year period. These data are evidence that blister rust has become established on pines in certain portions of the Menominee Indian Reservation, that the disease is on the increase, and that Ribes eradication work must be carried on as rapidly as possible.

"Table of Infection Data Collected on the Menominee Indian Reservation, T30N, R16E, and T29N, R15E - 1933.

No. of Strip	No. of Chains	Number of White Pines: Total	Too Large to Inspect	Total No. Examined	Number Healthy	Infected: No.	Infected: %	Number: No.	Number: No. by years of cutting
1	8	150	31	119	105	14	11.7	30	4 - 1928 9 - 1929 13 - 1930 5 - 1931
2	8	164	78	86	80	3	3.4	5	2 - 1928 3 - 1929
3	14	435	40	395	370	6	1.5	7	4 - 1930 3 - 1931
4	20	94	31	63	61	2	3.1	3	1 - 1928 1 - 1930 1 - 1931
5	8	125	74	51	50	1	1.9	1	1 - 1930
6	15	380	28	352	340	12	3.4	16	1 - 1929 6 - 1930 5 - 1931 1 - 1932
7	14	122	17	105	86	20	18.4	32	2 - 1928 7 - 1929 8 - 1930 5 - 1931 24 - 1932 27 - 1933 28 - 1934 10 - 1935 81 - 0 Virgin
Total	87	1,461	297	1,164	1,106	58	4.98	82	

No. of Strip	Ribes: No. and Species	Ribes: Feet of Live Stem	For Acre Values: Total No. of White Pines	For Acre Values: Total Number Ribes	For Acre Values: Total Amount Live Stem	Remarks
1	13 cynos.	67.5	937	75	360	Grad. in part on strip, 1933.
2	10 cynos.	11.5	1,085	82	72	1 mile E. of Keshena. Scarcity of Ribes 1933.
3	71 cynos.	171.0	1,513	110	611	--
4	111 cynos. 8 acer. 22 triste	479 56 78 613	235	347	1,868	Low ground along creek.
5	23 cynos.	177	781	144	1,136	--
6	-0-	-0-	1,287	-0-	-0-	Ribes grad. in 1930 and 1931.
7	2 cynos.	4	430	4	14	Ribes grad. in 1930 and 1933.
Totals	217	1,044	852	124	600	

Informational Activities

The description of informational activities in Wisconsin in 1933 is quoted from the Wisconsin Annual Report for 1933.

"Since white pine blister rust has been in Wisconsin a comparatively short time, information on it such as identification, immediate and potential damage, the fact that there is a practical control and the method of control is of value to pine owners and is being brought to their attention. Blister rust control men have found instances where the disease had made an inroad on a pine stand without the owner knowing just what was responsible for the damage. It is the desire of this office to teach the pine owners of Wisconsin that each Ribes bush near pine trees is a potential hazard to future pine crops and that white pines can become infected only when Ribes bushes are growing within infection distance of the pines.

"Several means were used to carry this information to the people in the state:

"1. Radio. A talk, "The Future of White Pine in Wisconsin," was broadcast over Radio Station WHA, University of Wisconsin Station at Madison, and rebroadcast over WLBL, Stevens Point Station operated by the Wisconsin Department of Agriculture and Markets.

"2. Magazines and Newspapers. News articles on blister rust were released several times by the department during the year. Each of these state releases was sent directly to 330 weekly papers and 48 daily papers.

Articles of local interest were frequently given to newspapers in the community in which local control work was in progress. For instance, when N.R.A. work was conducted at Superior, Wisconsin, articles on blister rust were printed in "The Evening Telegram" and the "Superior Journal". In Door County, when men from relief lists were doing Ribes eradication work there, articles were printed in the "Door County Advocate" and the "Door County News".

An article, written by T. F. Koube, entitled, "White Pine Blister Rust", appeared in the "Ames Forester", an annual publication published by the Forestry Department of Iowa State College at Ames, Iowa.

"3. Mimeographed Publications. Two mimeographed articles were prepared. One entitled, "White Pine Blister Rust: A Disease of White Pines", by E. L. Chambers and T. F. Koube was written for the Junior Forest Rangers and school

children having school forests; a copy of this article appears on page 85. The other article, having a similar title but somewhat condensed was prepared for the Conservation Department personnel, a copy of which appears on page 80. The latter article was approved and sent to the Conservation Department officials by Paul D. Kelleter, Conservation Director.

"4. State and Federal Publications. Approximately 300 copies of the Wisconsin Department of Agriculture and Markets Bulletin No. 124, entitled "Some of the More Important Insects and Plant Diseases of Trees and Shrubs", were distributed to interested persons. In addition, some 4,000 U.S.Department of Agriculture Miscellaneous Publication No. 22 (Rev.), "How Blister Rust Spreads and Destroys White Pines", were also distributed, principally to white pine owners. White pine blister rust information was inserted in an application blank called, "Application For Trees for Forest Planting", issued by the Wisconsin Conservation Department. A copy is given to persons who purchase trees at the Trout Lake or Wisconsin Rapids State Nurseries. Paragraphs four and five under "Information", on the front side of the sheet, record this blister rust information. A copy of this blank appears on page 98.

"5. Fair Demonstrations and Displays. A white pine blister rust demonstration was placed at the Wisconsin State Fair in conjunction with the general exhibit of this division. It was the practice of this department during the field season to place displays wherever possible in regions where control work was being performed. This was done at Sturgeon Bay, Wisconsin, and at several of the Emergency Conservation Work camps.

"6. Specimens. Several dried and also preserved specimens of white pine blister rust in the aecial stage were sent during 1933 to E.C.W. camps and schools having school forests. A number of open faced envelopes with a cellophane face in which diseased leaves infected with blister rust were placed were sent to those who wished to become familiar with the disease."

Costs

In Table 67 is shown a summary of costs of blister rust control incurred by the various agencies in Wisconsin in the amount of $76,445.58. Approximately 87 percent of these costs were for salaries and wages.

In Tables 68 and 69 figures in Table 67 are shown as percentages.

From Table 68 it is seen that the general supervisory costs were borne by the Regular B.E.C., N.R.A., and State E.C.W. programs.

Table 67.- State and Federal Expenditures for all Blister Rust Control Projects, Wisconsin, 1933.

Agency	Expenditure classification	Supervision	B.R.C. agent activities	Ribes eradication	Nursery sanitation	Pre-eradication survey	Checking	Equipment and misc.	Total
State	Salaries		$131.07	$92.54					$223.61
	Expenses		224.12	158.68				$6.22	389.02
	Total		355.19	251.22				6.22	612.63
Regular B.R.C.	Salaries	$385.00	1,155.00	2,497.60					4,037.60
	Expenses	190.10	635.77						825.87
	Total	575.10	1,790.77	2,497.60					4,865.47
N.R.A.	Salaries	604.33	1,014.50	4,607.95		$430.00			6,656.78
	Expenses	194.72	699.60	25.00		381.50		18.27	1,319.09
	Total	799.05	1,714.10	4,632.95		811.50		18.27	7,975.87
State E.C.W.	Salaries	1,938.00		22,255.09	$2,244.42	7,863.68	$1,938.00		36,239.19
	Expenses	867.77		777.65		1,939.32	867.78	461.10	4,913.62
	Total	2,805.77		23,032.74	2,244.42	9,803.00	2,805.78	461.10	41,152.81
For.Ser. E.C.W.	Salaries			2,606.93	78.90	432.53			3,118.36
	Expenses					185.37			185.37
	Total			2,606.93	78.90	617.90			3,303.73
Ind.Ser. E.C.W.	Salaries			11,534.10		127.50			11,661.60
	Expenses			1,074.14		99.75			1,173.89
	Total			12,608.24		227.25			12,835.49
Technicians E.C.W.	Salaries		261.21	32.14		239.39	13.86		547.10
	Expenses		292.59	28.64		183.46	10.98		515.67
	Total		553.80	60.78		423.55	24.84		1,062.77
C.W.A.	Salaries					4,364.11			4,364.11
	Expenses							274.70	274.70
	Total					4,364.11		274.70	4,638.81
Total	Salaries	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
	Expenses	1,252.59	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 88.- Percent of Activity Expenditures Spent by Each Agency, Wisconsin, 1955.

Agency	Super-vision	S.R.C. agent activities	Ribes eradi-cation	Nursery sanita-tion	Pre-eradi-cation survey	Checking	Equip-ment and misc.	Total
State		8.1	0.8				0.9	
Regular S.R.C.	18.8	40.8	8.5					
F.R.A.	19.1	38.3	10.1		5.0		2.4	
State W.C.W.	67.1		50.4	96.6	60.3	99.1	60.7	
For.Ser. W.C.W.			5.7	3.4	3.8			
Ind.Ser. S.C.W.			27.8		1.4			16.6
Tech-nicians S.C.W.		12.6	.1		2.6	.9		
C.W.A.					26.9		36.1	

Table 69.- Percent of Each Agency Expenditure Spent on Each Project, Wisconsin, 1933.

Agency	Super-vision	B.B.C. agent activities	Ribes eradi-cation	Nursery sanita-tion	Pre-erad-ication survey	Checking	Equip-ment and misc.	Total
State		58.0	41.0				1.0	100.0
Regular B.B.C.	11.8	36.8	51.4					100.0
U.S.A.	10.0	21.5	58.1		10.2		.2	100.0
State C.C.W.	6.8		56.0	5.5	23.8	6.8	1.1	100.0
For. Ser. C.C.W.			78.9	2.4	18.7			100.0
Ind.Ser. C.C.W.			98.2		1.8			100.0
Tech-nicians C.C.W.		52.3	5.7		39.8	2.4		100.0
U.S.A.					94.1		5.9	100.0

Nearly 97 percent of State expenditures were met first by the various C.C.C. agencies, chiefly by the State C.C.C.

Forest sanitation was performed entirely on C.C.C. funds, nearly all by the State C.C.C.

The State C.C.C. and C.W.A. paid for most of the pre-eradication survey work.

Over 3/4 of the entire expenditures of white pine rust control in the state were paid for by the C.C.C., chiefly the State C.C.C.

It may be noted in Table 68 that the major portion of the state expenditures was charged to C.C.C. agent activities.

Over half of the regular C.C.C. funds were spent on actual fiber eradication. The remainder was spent on general supervision.

Fifty eight percent of the C.W.A. funds were spent on fiber eradication. The remainder was spent on pre-eradication surveys and general supervisory activities.

Fifty six percent of the State C.C.C. funds were spent on fiber eradication. Nearly 24 percent was spent on making pre-eradication surveys.

Forty two percent of the Forest Service C.C.C. and over 98 percent of the Indian Service C.C.C. funds were spent on fiber eradication.

Practically 100 percent of the C.W.A. funds went to pre-eradication survey. The 2.2 percent charged to equipment was equipment used in making pre-eradication surveys.

In considering all funds spent in the state, slightly over 11 percent was spent in general supervision and C.C.C. agent activities, nearly 80 percent were spent on fiber eradication and 9 percent spent on making pre-eradication surveys.

Summary and Conclusions

Wisconsin has just completed the most successful season of white pine blister rust control work since its inception in 1923. This was due largely to the greatly increased funds made available for unemployment and recovery purposes. Since nearly all expenditures were for labor, white pine blister rust control work was not continuous but is an ideal project for the use of such funds.

Due to the trend of the times to shorten working hours and increase the rate of pay on all unemployment relief projects, the blister rust project increased the pay of workers accordingly and shortened the working

hours; therefore, the most per acre of blister rust control work during 1933 was higher than such work done previously.

Since initial white pine protection has been afforded approximately only 8 percent of the [illegible] pine acreage in Wisconsin, it is evident that the job has barely begun. To protect the remaining 92 percent before serious injury occurs is the problem which confronts the white pine owners of the state.

White pine as a forest species has a favorable future if the pine stands are safeguarded against blister rust. If the use of unemployed labor is taken advantage of to the fullest extent in the blister rust control project, not only will worth-while jobs be given to unemployed men, but the project will save one of Wisconsin's most important state resources.

History of the Work and Scouting for the Host

Previous to 1932 blister rust work in Iowa was confined to scouting for the disease and tracing down shipments of pines from nurseries known to be infected.

Work started in the state in 1913 when a survey was carried out by Federal agents in cooperation with the State Entomologist. No blister rust was found.

In 1917 a more intensive survey was conducted by four Federal agents in cooperation with the State Entomologist. One blister rust infection was found on Pinus flexilis in a shipment from a Minnesota nursery in 1915 to a farmer in Larchwood, Lyon County, in the extreme northwestern corner of the state. This infected pine was destroyed and steps were taken by the State Entomologist to destroy the other pines in the same lot. The whole state was covered in the survey during which 432 inspections were made in 169 towns.

No work was done in 1918. In 1919 two Federal agents scouted for the rust in cooperation with the State Entomologist but no infection was found. Very little scouting for blister rust was done from 1919 to 1929.

In 1929, W. A. Guthrie, Assistant State Entomologist, found one European black currant quite heavily infected in Snyder's Nursery at Center Point in Linn County in the east central portion of the state. Later in the fall of 1929 five heavily infected cultivated black currants were found at West Union in Fayette County in the northeastern portion of the state and 20 cultivated black currants were found heavily infected at Ames in Story County in the center of the state. No scouting was done in 1930.

During 1931 a blister rust canker, positively identified as such by the Division of Forest Pathology, was found on a pine in the college nursery at Ames growing within approximately 1/4 mile of the cultivated black currants previously destroyed found to be infected in 1929. It is very probable that this single canker was of 1922 origin.

During 1932 a very limited amount of scouting was done. The pines at Iowa State Nursery at Ames were examined at various times by college authorities. From October 10 to 12, 1932, 7,660 pines were examined by Federal authorities and found free from blister rust. Black currant bushes at West Union found infected in 1929 were again

resulted in 1932 and no [illegible] locations.

During 1933 although nearly 12,000 white pines were examined by 11 field pathologists and blister rust checks timed on 8 C.C.C. camps [illegible] out the state, no infection was found.

In the spring of 1932 a limited amount of local control was undertaken in the town of McGregor in northeastern Iowa on an area owned by the U. S. Biological Survey. The Ribes eradication work was done by Junior Forester Miller of the U. S. Biological Survey and three assistants who spent one day in removing wild Ribes for a distance of 900 feet from the large white pine trees. They pulled 2,400 Ribes and covered about 30 acres.

The Ribes eradication work was commenced by the finding in early April of the suspected blister rust cankers on two of the large white pine trees in a growth of 25 to 30 years old. Both evaporated cankers were small and normal. Miller stated that the growth beyond the injury had been [illegible] the stages of scale but a pycnidiospore was present in the center of each canker.

Ritter and Fetrow examined these trees in 14th June of 1932 but failed to find any other signs of blister rust. They also checked on the Ribes eradication work and although thousands of currants and gooseberries were present no old bushes were found that were missed by the crews. In the fall of 1932 Fetrow again examined the area for blister rust on Ribes and pines but found none.

The only other control activity in Iowa in 1932 was a [illegible] survey made around the Earl Ferris Nursery at Cumberland, Iowa, and a small amount of Ribes eradication work done on October 17 and 18 around this nursery.

On the Penn Indian Reservation a pre-eradication survey was made and [illegible] plantings of approximately eight acres of white pine.

Organization

Control work in 1932 was prosecuted principally by means of the State C.C.C., P.W.A. and C.W.A. programs.

C.C.C. Projects.

Blister rust control was part of an [illegible] tree disease project organized the latter part of June, 1933. Sixteen technical foresters and one pathologist were employed under the supervision of a technician. The objectives of this project were as follows:

(1) To determine the location and extent of [illegible] infection as follows:

(a) White pine blister rust (Cronartium ribicola).
(b) Peach disease (Prunus spp.)
(c) Dutch elm disease (Graphium ulmi)
(d) Larch canker (Dasyscypha Willkommii)
(e) Pine pucker (Genus unknown).

(2) To determine the prevalence and character of native tree diseases as a basis for recommending sanitation measures.

(3) White pine blister rust control.

W.P.A. Program

Under the National Recovery Administration $10,000 was made available in August, 1933, for blister rust control work in Iowa. On October 16, 1933 D H Lubberts was appointed as Blister Rust State Leader to work under the administrative direction of the State Cooperator Prof G H MacDonald, of the Forestry Department. The State leader devoted his attention during the remainder of the calendar year to organizing a pre-prediction and white pine shelterbelt census carried on under the Civil Works Administration.

C.W.A. Program.

On December 8, 1933, the Iowa Civil Works Administration approved the State Leader's application for an allotment of funds "to be used on blister rust survey and shelterbelt census". On December 10 the field organization was completed and December 11 field work was started. Twenty men were employed under the C.W.A. program, 10 crews of two men per crew, each crew assigned to a county.

Each crew foreman was paid $1.20 per hour for 30 hours per week. All expenses, including travel by personal autos, were borne by these crew foremen. The assistants each received $0.50 per hour, 30 hours per week, and paid their own living expenses. The results obtained under this program are shown elsewhere in this report.

A Memorandum of Understanding was agreed upon and signed by the cooperating agencies for cooperative control work in the state. It is shown in full following:

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY
FORESTRY SUB-SECTION, IOWA AGRICULTURAL EXPERIMENT STATION
THE EXPERIMENT STATION PLANT PATHOLOGIST, AND THE STATE
ENTOMOLOGIST OF IOWA

Cooperative Work in Controlling White Pine Blister Rust in Iowa

The object of the cooperative work outlined herein is to provide for scouting and inspection for the white pine blister rust in Iowa and for the application of such methods of eradication or control as may be necessary.

A The United States Department of Agriculture, Bureau of Plant Industry Agrees:

(1) To pay the salaries and necessary travel expenses of [illegible] men for such time as may be necessary to determine the presence and limits of the spread of this disease in Iowa and under the supervision of the Forestry Sub-Section, Iowa Agricultural Experiment Station and the State Entomologist of Iowa, cooperate in the eradication or control of the disease.

(2) To assume responsibility for technical instruction of employees engaged in these investigations and in blister rust eradication and control work.

(3) To conduct such experiments and demonstrations as may be desirable for the purpose of securing effective control of the white pine blister rust in Iowa.

B The Forestry Sub-Section, Iowa Agricultural Experiment Station Agrees:

(1) To assume the administrative direction of the aforesaid employees of the United States Bureau of Plant Industry.

(2) To conduct such control activities as may be agreed upon each year by the cooperating parties.

(3) To prepare an annual report of all blister rust control work performed under the provisions of this memorandum, one copy of which will be delivered to each of the cooperating parties.

(4) To submit in prescribed form to the United States Bureau of Plant Industry a monthly report of salaries and expenses paid by the State on Blister Rust control work.

(5) To have all salary and expense vouchers of temporary employees to be paid out of Federal funds approved by the individual directly in charge of supervising cooperative blister rust control work in the field before being submitted to the United States Bureau of Plant Industry for payment. This individual shall be under appointment as a collaborator without compensation in the United States Department of Agriculture. All Federal funds expended in connection with this cooperative work shall be disbursed in accordance with the fiscal regulations of the United States Department of Agriculture.

C The State Entomologist of Iowa Agrees:

(1) To cooperative in such survey and control activities in the vicinity of commercial nurseries as may be necessary to the control of the disease in Iowa.

(2) To undertake such destruction of white pines or Ribes in Iowa and such enforcement of State laws as may be necessary for the effective prosecution of blister rust eradication and control work.

B The Experiment Station Plant Pathologist Agrees:

(1) To serve in an advisory capacity in matters pertaining to the plan of work, identify specimens of the rust, furnish advice on the technical aspects of the disease and assist in the training of men in methods of recognizing different stages of the rust on pines and Ribes.

C It is Mutually Agreed:

(1) That the details of this cooperative work shall be planned and executed jointly by the Bureau of Plant Industry through its Division of Blister Rust Control and cooperating State agencies.

(2) That this memorandum of understanding shall take effect July 1, 1933, and continue in effect until June 30, 1934, provided that any one of the parties may terminate the agreement at any time by a written statement to that effect 30 days in advance of the date of termination desired.

(3) That all persons appointed by the United States Bureau of Plant Industry and its cooperators under this memorandum shall be satisfactory to the cooperating parties.

(4) That the results of the cooperative work may be published jointly, or upon mutual agreement, by any one of the cooperating parties, with due credit given to the cooperating agencies. All manuscripts therefore shall be criticized by the cooperating parties before publication and all farm letters, bulletins and any other circulars to be mailed in penalty envelopes shall be submitted in manuscript form for approval by the United States Department of Agriculture before being printed or sent out in accordance with Federal law.

(5) That any expenditures involved in the work herein assumed by the United States Bureau of Plant Industry are contingent upon appropriations made by Congress for continuance of these activities, but no Federal funds shall be expended in compensation for host plants destroyed in control work.

(6) That for the fiscal year July 1, 1933 to June 30, 1934, the Forestry Sub Section, Iowa Agricultural Experiment Station and its cooperators will expend about $1,700.00 in coordinated services and the Federal Government on behalf of the United States Bureau of Plant Industry about $10,000 in connection with the work herein provided for, provided, however, that the services expended by the Federal Government shall not exceed $16,000.

In witness whereof the parties hereto have severally signed these presents on the respective days and dates hereinafter set forth.

October 6, 1933 — Date
/S/ D. B. Macdonald
Forestry Sub-Section, Iowa Agricultural Experiment Station

October 5, 1933 — Date
/S/ I. E. Melhus
Experiment Station Plant Pathologist

October 6, 1933 — Date
/S/ E. R. Buchanan
Director of the Agricultural Experiment Station

October 4, 1933 — Date
/S/ Carl J. Drake
State Entomologist of Iowa

October 18, 1933 — Date
/S/ William A. Taylor
Chief, Bureau of Plant Industry, United States Department of Agriculture

Tree Disease Survey Work Performed under E.C.W.

The results of the work performed under the tree-disease survey project of the E.C.W. program from July 1, to September 30, 1933, exclusive of blister rust control, are quoted from a report on "Tree Disease Survey Emergency Conservation Work in Iowa", prepared by Dean C. Helmick, Technician in Charge:

"Townships inspected	71
Parks surveyed	12
Counties represented (with park work in 7 others)	11
Technical foremen used	16
Checkers used	3
Average number E.C.W. men used per day	70
Shelterbelts inspected	2,651
Native stands inspected	994
Total locations inspected	[illegible]

Number trees inspected:

Oaks	15,586
Elms	22,921
Maples	46,179
Poplars	8,085
Ash	8,879
Pine	8,704
Spruce	8,258
Others	80,354
Total	212,776

Suspected samples of Dutch Elm Disease sent in | 60
Dutch Elm disease found | 0

"Various tree troubles found, and estimates of the disease distribution and damage.

"Elm

"Stagheading. The red elm generally and the white elm often show dead tops and branches. Much of this trouble seems to follow the entrance of disease after storms or other injury It is prevalent throughout the state on native elm.

"Mosaic-like disease. This trouble is most prevalent in the southeastern one-fourth of the state. In some sections the affected trees constitute 30-40 percent of the elm stands. The disease seems to result in the gradual starvation and killing of the trees.

"Poplar

"Cytospora, and Dothichiza canker. This canker is especially destructive to large toothed aspen, quaking aspen and lombardy poplar. It is quite general in eastern Iowa, in Palisades park, 50 percent of the trees have been marked for removal because they are dead or dying from these cankers.

"Oak

"In many areas of the state the oaks are dying in great numbers. The cause is not known but the damage is great.

"Butternut

"Stagheading. Probably this is caused by Melanconis and it is so prevalent that healthy butternut trees are hard to find and large trees are scarce.

"Ash

"Canker. In the northwestern part of the state, in particular, this trouble is severe. In Spencer about 60 percent of the ash trees are severely damaged or dying. The cause is not definitely known.

"Maples

"Stagheading. This is a common condition of a large part of the soft maple wind breaks in central and northern Iowa. It is probably caused by Verticillium.

"Willow

"Willow windbreaks are very seldom in healthy condition being more often stagheaded or severely killed back. An examination generally finds Cytospora cankers which may or may not be the cause of the dying.

Identification

"Specimens of diseased trees were collected by the field men and sent in to the central office for identification. Until college opened, the Botany and Plant Pathology Section made available three qualified men, pathologists, for the identification of this material. To date about one-third of the specimens have been identified and illustrated. From this part of the material 80 different species of fungi representing 54 genera have been identified. All of these have been listed and described and a copy furnished to each forester as a help in future work. Of these fungi about 50 percent have not been previously reported from Iowa and about two or three percent have not been reported from the United States. Which of these, if any, are dangerous pathogenes is still to be determined, although the prevalence of some of them indicates their potential danger."

White Pine in Iowa

Native white pine stands in Iowa are confined to the northeastern quarter of the state where they occur in small isolated stands occupying a total of perhaps 2,000 acres.

White pine is used quite extensively in Iowa for shelterbelts, particularly in the northern half of the state. In general, planted white pine makes excellent growth in the state and is probably the longest lived tree of Scotch pine and jack pine it has the lowest mortality of any of the conifers planted in Iowa.

Based on calculations made from shelterbelt census work performed, it is estimated that in the 99 counties of Iowa there are approximately 52,000 coniferous shelterbelts, of which 7,000 are classified as white pine shelterbelts, making approximately 2,000 acres of planted white pine in shelterbelts in the state.

It is difficult to estimate the value of white pine shelterbelts in the state. Farmers on numerous occasions have stated they value their shelterbelts at several hundred dollars each. A well developed shelterbelt affords considerable protection to the farmers stock and buildings, in addition to enhancing the value of the farmstead from a purely aesthetic standpoint.

The Iowa State Highway Commission in determining the value of a shelterbelt which they were required to remove offered to substitute a board fence in place of a white pine shelterbelt. The proposed fence was supposed to be 11 feet high and could be constructed at a cost of $1.04 per lineal foot.

It is estimated that the life of an average white pine shelterbelt is 80 years, the length of an average white pine shelterbelt is 200 feet, and the life of the proposed board fence 20 years.

If one could conceive of a board fence being a satisfactory substitute for a white pine shelterbelt, the cash value of either the white pine shelterbelt or a substitute board fence 11 feet high would be 200x1.04x80/20, or $832.00.

Each of the 10 C.W.A. crews systematically performed shelterbelt census work in an assigned county. They recorded the number and average height of coniferous trees making up each shelterbelt, estimated the work necessary to protect the white pine shelterbelt, explained the reason for removing lines and asked for the owners' cooperation in furnishing protection to each shelterbelt. In the great majority of cases the white pine shelterbelt owners valued their white pines much more than their cultivated fields and desired protection to their shelterbelts.

Table 70 shows the work performed under the C.W.A. organization during 1933 (December 11 to 31). Under "Total areas" are included all coniferous shelterbelts of eight or more conifers. Under "Total white pine areas" are included all shelterbelts having eight or more white pine trees.

Table 70.- Shelterbelt Census Performed Under C.W.A., December 11 to 31, 1933

County	Percent complete	Total areas	Total w.p. areas	Total hours Foreman	Total hours Assistant	Estimated man-days to work	Costs to date
Blackhawk	32	375	66	90	66	23	$121.00
Bremer	69	736	111	98	80	75	187.20
Butler	52	472	60	90	62	43	124.00
Cerro Gordo	50	411	68	96	78	29	158.80
Floyd	29	383	67	90	84	68	150.00
Franklin	39	473	90	96	90	20	177.75
Hancock	50	345	52	96	80	42	167.00
Mitchell	76	1,069	154	97½	79½	50	186.75
Winnebago	44	242	54	90	76	17	146.50
Worth	49	367	76	96	79	9	154.00
Total		4,873	784	841½	765½	384	1,600.00

Based on pre-eradication surveys and estimates made by E.C.W. men, Table 71 shows the acres of white pine and work to be done by E.C.W. forces in 1934. The cost of making this pre-survey by the E.C.W. forces was $207.44.

Table 71- Proposed Blister Rust Control, E.C.W. Camps, 1934

Camp No.	location County	Acres w.p. to protect	Acres to work Scout	Crew	Total	Man-days labor	Crew days labor	Man-months Super-vision
1	Delaware	100	24,000		24,000	360	60	6
12	Clayton	380	18,000	1,200	19,200	360	60	5
13	Dickinson	34	2,400		2,400	240	40	3
14	Howard	140	26,000		26,000	360	60	6
15	Winneshiek	520	14,000	1,500	15,500	360	60	5
18	Jones	50	6,000		6,000	240	40	2
21	Winnebago	46	5,600		5,600	240	40	2
27	Sioux	18	2,000		2,000	240	40	2
	Total	1,066	100,000	2,700	102,700	2,400	400	30

Local Control

A limited amount of local control was done around native stands and shelterbelts under the E.C.W. program. This is shown in Table 72.

Nursery Sanitation

Nursery sanitation was performed around three privately owned nurseries in the state; viz., the Earl Ferris Nursery at Hampton, the Scotch Grove Nursery at Scotch Grove, and the Mt. Arbor Nursery at Shendosh. These nurseries have applied for Federal white pine shipping permits. In each case it was necessary to go over the sanitation zone two and some times three times before sanitary conditions were achieved. The work was supervised by H. E. Guthrie. J. M. Corliss of the Bureau of Plant Quarantine assisted very materially in checking the work and aiding in the removal of wild and cultivated Ribes. The work done is shown in Table 73. These nurseries will again be checked for Ribes in 1934.

Sanitation work around the college nursery at Ames was not performed because of the abundance of cultivated Ribes within the 1500-foot zone. It is contemplated that the college nursery will be moved to another location farther from town on a site much freer from both wild and cultivated Ribes than the present site.

Table 72.- Local Control, State E.C.W., Iowa, 1933.

Location	Owner-ship	No. jobs	Acres w. p. pro-tected	Acres worked			Ribes pulled			Man-days		Costs		
				Crew	Scout	Total	Crew	Scout	Total	Labor	Super-vision	Labor	Super-vision	Total
Pine Hollow	Private	1	60	60	0	60	9,467	0	9,467	60	20	$180.00	$120.00	$300.00
Boone County	City park	1	15	[1]60	[1]80	140	2,923	0	2,923	60	7	180.00	33.00	213.00
Lucas County	Shelter-belts	29	16	0	1,408	1,408	0	9,466	9,466	282	15	846.00	59.00	905.00
Total		31	91	120	1,488	1,608	12,390	9,466	21,856	402	42	$1,206.00	$212.00	$1,418.00

[1] Estimated.
C.C.C. labor based on $3.00 per man-day.

Informational Activities

During the year 1933 approximately 5,000 owners of white pine stands were interviewed and informed as to the potential danger of white pine blister rust to their shelterbelts and plantings. A very satisfactory degree of interest was shown by these owners in the great majority of cases.

Several hundred copies of U.S.D.A. Publication No. 22, "Protect White Pine From Blister Rust", were distributed among the owners and potential owners of white pine plantings.

Thirteen Iowa newspapers printed several articles concerning the work of the E.C.W. and C.W.A. blister rust field crews. Reports from the field crews indicate that this medium of education has aided them considerably in securing a favorable statement of attitude on the part of shelterbelt owners.

Costs

It was impossible to accurately separate the costs of blister rust control work from the total costs of the E.C.W. tree-disease survey project. The total cost for the tree-disease survey project was $19,954.39. This includes supervisory salaries, transportation, equipment, and wages of enrollees at $3.00 each per day.

It is estimated by the State Leader that 10 percent of this figure should be charged to blister rust control. This would make the cost of blister rust control work performed by the State E.C.W. $1,995.44.

In Table 74 is shown the total cost of blister rust control performed in Iowa in 1933.

Summary and Conclusions

White pine blister rust has been reported at three different locations on Ribes in Iowa and on white pine at one of these locations prior to 1933. No rust was found in the state in either 1932 or 1933.

It is estimated that there are 2,000 acres of native white pine in the state and 2,000 acres in 7,000 white pine shelterbelts with an average of 35 white pine trees in each shelterbelt.

Local control work in the state was performed entirely on E.C.W. funds. Twenty-nine shelterbelts and two native stands consisting of approximately 91 acres of white pine were protected by the removal of 21,356 Ribes from 1,309 acres at a cost of 402 man-days of labor.

Nursery sanitation was performed around three private nurseries.

White pines are valued highly by owners as an excellent species for shelterbelt use and are planted extensively in the state for this purpose. The general attitude of owners of white pine shelterbelts toward their protection against blister rust is predominantly favorable.

Table 74.- State and Federal Expenditures for all Blister Rust Control Projects, Iowa, 1933.

Agency	Expenditure classification	Supervision	Ribes eradication	Nursery sanitation	Pre-eradication survey	Equipment and misc.	Total
State	Salaries	$75.00		$154.60			$229.60
	Expenses					$20.00	20.00
	Total	75.00		154.60		20.00	249.60
N.R.A.	Salaries	400.00					400.00
	Expenses	80.60					80.60
	Total	480.60					480.60
State E.C.W.	Salaries		$1,225.00	270.00	207.44		1,702.44
	Expenses			100.00			100.00
	Total		1,225.00	370.00	207.44		1,802.44
Parks E.C.W.	Salaries		193.00				193.00
	Expenses						
	Total		193.00				193.00
Technicians E.C.W.	Salaries	177.82					177.82
	Expenses	200.16					200.16
	Total	377.98					377.98
C.W.A.	Salaries				1,506.05		1,506.05
	Expenses						
	Total				1,506.05		1,506.05
Total	Salaries	[illegible]	1,418.00	[illegible]	[illegible]		[illegible]
	Expenses	280.76		100.00		20.00	[illegible]
	Total	[illegible]	1,418.00	[illegible]	[illegible]	20.00	[illegible]

Table 75.- Percent of each Agency Expenditure spent on each Project. Iowa. 1935.

Agency	Super-vision	Ribes eradi-cation	Nursery sanita-tion	Pre-erad-ication survey	Equipment and misc.	Total
State	30.1		61.9		8.0	100.0
N.R.A.	100.0					100.0
State E.C.W.		68.0	20.5	11.5		100.0
Parks E.C.W.		100.0				100.0
Technicians E.C.W.	100.0					100.0
C.W.A.				100.0		100.0
Total	30.2	36.7	31.8	37.1	.4	100.0

Table 76.- Percent of each Project Expenditure spent by each Agency, Iowa, 1933.

Agency	Super-vision	Ribes eradi-cation	Nursery sanita-tion	Pre-erad-ication survey	Equipment and misc.	Total
State	8.0		29.5		100.0	5.4
N.R.A.	51.5					10.4
State E.C.W.		86.4	70.5	12.1		39.1
Parks E.C.W.		13.6				4.2
Technicians E.C.W.	40.5					8.2
C.W.A.				87.9		32.7

BLISTER RUST CONTROL, ILLINOIS, 1933

History of the Work

Previous to 1932, blister rust control work in Illinois was chiefly confined to scouting for the disease and tracing shipments of pines from nurseries known to be infected.

No blister rust has ever been found on white pine or Ribes in this state. However, blister rust on German-grown white pine at St. Croix Falls and Amory, Wisc., and Taylor's Falls, Minn., in 1916 was traced to a large forest-tree nursery in Illinois which imported the white pine from J. Neller, Helstenbek, Germany, in 1908 and 1909.

From 1917 to 1919, inclusive, scouting work was done by Federal agents in cooperation with the State Nursery Inspector's staff. In this work they inspected all nurseries handling white pine and all known private plantings. No rust was found.

Practically no further work was done on blister rust control until 1931 when Messrs. Shaels and Pierce made a short scouting trip in the northern part of the state. They found no rust.

In 1932 a memorandum of understanding was drawn up between the Illinois State Department of Public Works and Buildings, the Illinois State Department of Agriculture, and the U. S. Department of Agriculture. Control work was done on Ex-Gov. Lowden's estate and the Pines State Park near Oregon. In these two jobs, 230 acres of planted and native pine were protected by the removal of 202,660 Ribes from 1,956 acres at a cost of $0.54 per acre worked. An average of 7.3 acres with Ribes averaging 103.5 bushes per acre was worked per man-day.

Organization

Practically the only organization for blister rust control in 1933 consisted of one man, F. W. Gerdel, hired on E.C.W. funds to make a survey of the state, for the purposes of finding locations of white pine, estimating the eradication problem, scouting for blister rust and other serious imported diseases. He worked from September 1 to November 18. During a portion of October and November, E.C.W. Technician Donald Stewart assisted Gerdel in making pre-eradication surveys.

Although an allotment of $10,000 had been made from N.R.A. funds for blister rust control work in Illinois, none of this money was spent during the calendar year 1933 in the state.

The only local control performed in the state was second eradication on Ex-Gov. Lowden's estate performed entirely by his labor and supervision.

Table 77.- Pre-eradication Survey, Illinois, 1933.

Program	Proj. No.	Owner	Address	White pine acreage or planting site		Acreages to work			Man-days required		
						Crew	Scout	Total	Crew	Scout	Total
Completed	1	Minnissippi Farms	Oregon	125		0	0	0	0	0	0
E.C.W.	2	The Pines	do	150		60	60	120	120	10	130
W.R.A.	3	Lowell Park	Dixon	15	plus planting site	210	0	210	420	0	420
do [1]	4	Ingersol Memorial Park	Rockford	10	plus nursery	40	190	230	80	15	95
do	5	Black Hawk Park	do	10		50	60	110	90	6	96
do	6	Minnissippi Park	do	12		45	0	45	120	0	120
do	7	Rock Cut Preserve	do	3	plus planting site	230	180	410	390	9	399
do	8	Seward Bluffs	do		planting site	160	22	182	40	10	50
do [1]	9	Kishwaukee Preserve	do		planting site and nursery	55	100	155	254	4	258
do	10	Killbuck Bluffs	do		planting site	140	0	140	215	0	215
do [1]	11	Kononeria Preserve	do		planting site and nursery	29	100	319	60	15	75
do [1]	12	Hacktown Preserve	do	5	plus nursery	42	105	147	125	10	135
E.C.W.	13	Starved Rock Park	LaSalle	67	plus planting site	290	40	330	1,500	2	1,502
do	14	Palos Hills	Chicago	25		174	0	174	250	0	250
Naturally protected	15	Waukegon Quad.	Waukegon	500		0	0	0	0	0	0
do	16	Mesa. Palisades Park	Savanna		planting site	0	0	0	0	0	0
E.C.W.	17	Bath Cemetary	Bath	5		0	50	50	0	10	10
Protected	18	Principia College	Jersey County	20		0	0	0	0	0	0
E.C.W.	19	Oregon Cemetary	Oregon	5		10	55	65	30	4	34
W.P.A.	20	Deer Park	LaSalle	15		200	0	200	390	0	390
Total				467		1,742	1,002	2,796	4,084	85	4,169

[1] White pine nursery.

Spread of the Rust

No blister rust was found, although a considerable amount of scouting for the rust, particularly on cultivated black currants was done.

Pre-eradication Survey

This work was done in October and November by Stewart and Griffith. All known pine stands worthy of protection were covered. Twenty individual areas were examined. Two of these areas had been initially protected in 1932 and three of them were naturally protected because they were Ribes free. It was estimated that a total of 4,143 man-days would be required to eradicate Ribes from 2,795 acres.

The best white pine areas are in Winnebago County, in the vicinity of Oregon, in the Starved Rock State Park at LaSalle, and in the northeastern corner of the state at Waukegon.

In Winnebago County is one city park and three county forest preserves where white pines are being grown in nurseries for distribution to other parks and forest preserves.

In Table 77 are shown the details of pre-eradication surveys performed.

In connection with the contemplated Ribes eradication work in Starved Rock State Park, special equipment for eradication work will be necessary because of the steep precipitous cliffs. Ribes are very abundant along the sides of these cliffs which average about 30 feet in height.

Local Control

The only Ribes eradication performed in 1933 was that done on the Cinnaminson Farms, owned by Ex-Gov. Lowden, which was entirely a second eradication. The costs of both labor and supervision were borne by Mr. Lowden. The initial work on this area was done in 1932. The details of the work are shown in Table 78.

Table 78.- Ribes Eradication, Cinnaminson Farms, Oregon, Ill.

Eradication	Acres covered	Ribes pulled	Man-days labor	Costs[1]	Ribes per acre	Costs per acre	Cost per 1,000 bushes
1st, fall,1932	[2]1,350	100,769	135 7/8	$457.09	74.5	$0.34	10.1
2, Sep, 1933	1,350	7,600	36	91.20	5.6	.07	35.5
Total	1,350	108,188	171 7/8	$548.29	80.1	.41	5.1

[1]The 1932 costs included county labor, $305.40, and Federal supervision, $151.69. In 1933 there was no Federal supervision, and the entire cost was borne by the owner.

[2]Of the 1,350 acres, 231 acres were in cultivated fields not necessary to go over, leaving 319 acres worked by crew and 800 acres by scout in 1932. In 1933 all of the crew and about areas were covered by crew.

This work was superficially checked on May 11, 1933, by Fuhrer, and in October, 1933, by Jordal and Stewart, and found to be satisfactory.

At the Pines State Park initial Ribes eradication work was done in the fall of 1932 on 600 acres to protect 135 acres of white pine. Work was done in the fall when the Ribes were largely defoliated and many bushes were missed. Throughout 1933 the park superintendent and his men pulled Ribes bushes as they saw them, but no systematic Ribes eradication was performed.

Investigational Work

In September, 1932, Ribes missouriense bushes were treated with dry applications of sodium chlorate and ammonium thiocyanate, to determine the killing power of those chemicals. This experiment was performed at seven places on the Sinnissippi Farms, and at one place at the Pines State Park, both near Oregon, Illinois. On May 16, 1933, these plots were checked. The results are shown in Table 79.

The dry chemicals were applied in September, 1932, in roughly measured amounts at the base of each clump after the duff had been scraped away. Following application the chemicals were covered with duff.

No injury was apparent to any large tree growth although on Plot 4 a large oak was within one foot of a treated and dead Ribes bush. A few small willows 4' high were damaged on Plot 5 and on Plot 3 a dogwood 4' high one foot from a dead Ribes had been killed. The grass around treated bushes was not damaged.

The efficiency of dry applications of ammonium thiocyanate in killing R. missouriense seems to be somewhat greater than sodium chlorate, and apparently a smaller amount of ammonium thiocyanate per unit of live stem is required.

There appears to be little relationship between the amounts of chemical per unit of live stem used in this experiment and its killing power. Complete death of bushes resulted from the use of 2.6 and 3 lbs. of sodium chlorate per 1,000 ft. of live stem. Practically the entire live stem was killed by the use of ammonium thiocyanate at the rate of 1.70 lbs. per 1,000 ft. of live stem. On the other hand 3.69 lbs. of sodium chlorate per 1,000 ft. of live stem caused only 85% death, while .75 lbs. caused 84% death.

Several instances of scratching away the duff and gnawing of the basal bark was evident on bushes treated with sodium chlorate. No disturbance was noted on bushes treated with ammonium thiocyanate.

This experiment is being continued. Observations will be made relative to sprouting and seedling growth.

Table 79.- Results of Applying Dry Chemicals to R. missouriense, September 24 and 30, 1932, Oregon, Ill.

		Treated September 24-30, 1932				Alive May 16, 1933		
Plot No.	Chemical	Application. lbs.	Bushes	F.L.S.	Lbs. chemical per 1,000 F.L.S.	Bushes	F.L.S.	Remarks
Pines 1	Am. thiocyanate	6.00	2	3,500	1.70	1	0.3	Crown sprout.
Farm 2	do	12.50	29	5,710	2.19	5	13.0	Crown sprout and few small leaves along stems.
Pines 2	Sod. chlorate	5.75	2	2,200	2.61	1	26.0	Small leaves along stems.
Farm 1	do	6.00	7	1,625	3.69	3	250.0	Small leaves along stems.
Farm 3	do	9.25	10	3,025	3.06	1	15.0	Normal leaves on young growth.
Farm 4	do	9.00	15	2,970	3.03	0	0	All dead.
Farm 5	do	8.00	40	4,000	2.00	8	150.0	Imperfect healment at edge.
Farm 6	do	2.50	1	1,000	2.50	0	0	All dead.
Farm 7	do	3.00	5	4,000	.75	3	225.0	Insufficient chemical.
Total	Am. thiocyanate	18.50	31	9,210	1.91	6	13.3	
	Sod. chlorate	40.00	69	13,820	2.91	18	666.0	

Percent efficiency of Am. thiocyanate by bushes, 80.6; by live stem, 99.9.
Percent efficiency of Sod. chlorate by bushes, 80; by live stem, 96.5.

Table 80.- State and Federal Expenditures for all Blister Rust Control Projects, Illinois, 1935.

Agency	Expenditure classification	Ribes eradication	Pre-eradication survey	Total
State	Salaries	$91.20		$91.20
	Expenses			
	Total	91.20		91.20
State E.C.W.	Salaries		$250.00	250.00
	Expenses		175.00	175.00
	Total		425.00	425.00
Technicians E.C.W.	Salaries		97.14	97.14
	Expenses		104.29	104.29
	Total		201.43	201.43
Total	Salaries	91.20	347.14	438.34
	Expenses		279.29	279.29
	Total	91.20	626.43	717.63

Table 81.- Percent of each Agency Expenditure spent on each Project, Illinois, 1935.

Agency	Ribes eradication	Pre-eradication survey	Total
State	100.0		100.0
State E.C.W.		100.0	100.0
Technicians E.C.W.		100.0	100.0
Total	12.7	87.3	100.0

Table 82.- Percent of each Project Expenditure spent by each Agency, Illinois 1935.

Agency	Ribes eradication	Pre-eradication survey	Total
State	100.0		12.7
State E.C.W.		67.8	59.2
Technicians E.C.W.		32.2	28.1
Total	100.0	100.0	100.0

Costs

In Table 60 are shown the costs of control work done in Illinois in 1933. No charge for supervision is shown. The costs are charged entirely to pre-eradication survey on C.C.C. funds and Ribes eradication performed by owner's labor.

Summary and Conclusions

All of the known stands of white pine in Illinois worthy of protection have been covered by pre-eradication surveys. It is hoped that local control around these stands can be completed in 1934 on E.C.W. or other funds.

The only control work done was a second eradication performed on Ex-Gov. Lowden's estate at his own expense, both for labor and supervision. No rust has been found in this state.

BLISTER RUST CONTROL, INDIANA, 1933

History of Work and Status of the Rust

"The blister rust was found by Benjamin W. Douglass, Indiana State Entomologist, in 1910 on a shipment of white pine from Europe at the Princeton Nursery at Princeton. The whole lot of pines was destroyed at once. No disease has been since found in the state." (Report on White Pine Blister Rust Survey for Indiana 1917 by Roy G. Pierce).

From 1917 to 1920, inclusive, blister rust control work in Indiana consisted of scouting for the rust during the summers by Federal employees in cooperation with members of the State Nursery Inspection Service. Emphasis was placed on destroying shipments of white pine from infected nurseries. No rust was found.

A rust on Ribes nigrum was collected in late October, 1929, by R. A. Sheals in northwestern Indiana practically on the Indiana-Ohio line. It is possible that this was Cronartium ribicola, although it was not possible to positively identify it as such because of the condition of the specimen.

In 1931 Sheals and Pierce made a short scouting trip in northern Indiana. No infection was found.

In 1932 the only work done in Indiana consisted of a short inspection trip made by Putnam primarily for the purpose of conferring with state officials regarding blister rust control work. No rust was found although several likely places were examined en route.

Organization

The entire control work done in Indiana in 1933 was performed on E.C.W. funds. On July 5 a state checker, F. F. Franklin, was appointed. He worked from July 5 to September 30, 1933. His duties consisted of making a pre-eradication survey of all worth-while white pine areas in the state, in organizing and giving general supervision to control work around these areas, and in scouting for white pine blister rust and other important forest-tree diseases.

Control work was performed out of three state E.C.W. camps using C.C.C. labor and E.C.W. foremen.

Pre-eradication Surveys

The entire state was covered by Mr. Franklin in his pre-eradication survey work. Pre-eradication surveys were performed around all known areas of white pine stands worthy of protection.

Probably the outstanding result of the 1933 control program was the discovery that 4,000,000 acres (practically the entire southwestern quarter of the state) is Ribes free and can be planted to white pine without fear of rust infection. Fortunately, it is this region of the state that is most in need of reforesting and no conifer does better than white pine in this area. This latter point is attested by growth results noted at Dupont, Henryville, Orangeville, St. Meinrad, and at the Brown County Game Reserve. In some plantations at Henryville the normal "leader growth" on pole-sized white pine averages more than 2 feet per year. No southern Indiana commercially important timber tree exceeds this with the possible exception of the yellow and white poplars. Another area, the old Kankakee marsh land in the northwestern part is relatively free of Ribes but is such a rich farming land that it is not likely forest trees will ever be planted there.

Native pine in the state is confined to three parks (Turkey Run, The Shades, and Dunes) and to no more than a dozen small stands in the vicinity of Warren County. These stands are all very small, composed of maturing trees and considered not worthy of protection. The control program therefore has been confined to planted white pine throughout the state and to planting sites within two or three state parks.

The pre-eradication surveys showed 631 acres of white pine worthy of protection. Three hundred twenty three acres of this total were protected initially in 1933. In Table 83 are shown the estimates of work required to protect the remaining 308 acres in the state.

The pre-eradication survey performed in Indiana in 1933 on E.C.W. funds cost $510.25 plus assistance furnished by State Research Foresters Deam and others in the estimated amount of $50.00, making the total cost $560.25. A portion of this amount should be charged against areas which were worked during the 1933 season. It is expected that the areas unworked in 1933 will be protected during the 1934 eradication season.

Local Control

In Table 84 is shown a statement of control work done by state I.C.W. forces in 1933. Note that of the 23 jobs done 16 showed no Ribes and were covered by scouting work on the part of Mr. Franklin.

In Table 85 are shown per-acre costs and Ribes derived from Table 84.

In Table 86 the acres of white pine protected have been classified according to ownership classes. It may be noted that 41 percent of the white pine protected was under state and 59 percent under private ownership.

Checking

Areas on which crew work was performed during 1933 were checked carefully except the partly completed work done at the Crosley farm in Jennings County. This latter area is to be finished in 1934 and instructions have

Table 35.- Summary of Pre-prediction Survey, White Pine in Indiana, 1975

County	No. jobs	Acres w.p. to protect	Acres to work			Estimated man-days		
			Crew	Scout	Total	Crew	Scout	Total
Brown	1	15	200	0	200	30	-	30
Jennings	4	112	700	240	940	300	6	306
Ripley	1	35	150	40	190	25	2	27
Vigo	1	10	40	40	80	10	1	11
Montgomery	1	11	11	0	11	5	0	5
White	1	20	80	70	150	20	2	22
Porter	2	20	150	66	216	30	3	33
St. Joseph	1	25	70	30	100	30	2	32
Pikhart	1	5	25	0	25	5	0	5
Clay	3	16	100	110	210	30	2	32
Steuben	2	13	60	40	100	10	2	12
Cass	1	10	70	0	70	10	0	10
Marshall	1	4	30	0	30	6	0	6
Madison	1	7	50	0	50	10	0	10
Hancock	1	5	20	20	40	10	1	11
Total	29	509	1,744	806	2,550	580	21	601

Table 84.- Local Control, E.C.W., Indiana, 1933.

County	Owner-ship	No. jobs	Acres w. p. pro-tected	Acres worked			Ribes pulled			Man-days		Costs		
				Crew	Scout	Total	Crew	Scout	Total	Labor	Super-vision	Labor	Super-vision	Total
Morgan	State	1	15	150	0	150	15,401	20	15,421	96	17	$96.00	$83.00	$179.00
Owen	do	1	72	200	0	200	2,704	0	2,704	105	17	105.00	146.80	251.80
Brown	do	1	3	0	15	15	0	0	0	0	.5	0	5.00	5.00
Greene	Private	2	32	0	140	140	0	0	0	0	1.25	0	12.00	12.00
Orange	do	2	102	0	440	440	0	0	0	0	2.5	0	25.00	25.00
Lawrence	State	1	17	0	75	75	0	0	0	0	.75	0	7.00	7.00
Harrison	do	1	10	0	40	40	0	0	0	0	.5	0	5.00	5.00
Spencer	Private	1	3	0	5	5	0	0	0	0	.5	0	5.00	5.00
Dubois	do	1	4	0	40	40	0	0	0	0	.5	0	5.00	5.00
Bartholomew	do	1	4	0	70	70	0	0	0	0	.5	0	5.00	5.00
Martin	State	1	4	0	50	50	0	0	0	0	.5	0	5.00	5.00
Pike	Private	1	3	0	40	40	0	0	0	0	.5	0	5.00	5.00
Scott	do	1	10	0	60	60	0	0	0	0	.5	0	5.00	5.00
Jefferson	do	1	7	0	60	60	0	0	0	0	.5	0	5.00	5.00
Jefferson	State	1	2	0	20	20	0	0	0	0	.25	0	3.00	3.00
Ripley	Private	1	2	0	5	5	0	35	35	0	.5	0	5.00	5.00
Decatur	do	1	3	0	5	5	0	53	53	0	.5	0	5.00	5.00
Sullivan	do	1	5	0	7	7	0	0	0	0	.25	0	3.00	3.00
Laporte	do	1	5	0	6	6	0	0	0	0	.25	0	2.00	2.00
Adams	do	1	5	0	4	4	0	0	0	0	.25	0	2.00	2.00
Jennings	do	1	15	80	0	80	90	0	90	65	11	65.00	51.70	116.70
Total		23	333	430	1,062	1,512	18,195	108	18,305	266	56	266.00	390.60	656.60

Table 85.- Rides Pulled and Cost Per Acre, Indiana, 1935

Agency	Acres worked to produce one acre plus	Percent total acres worked by crew	Rides pulled per acre: Crew	Scout	Total	Acres worked per man-day: Crew	Scout	Total	Cost per acre: Time period	Time prorated
C.C.C. Private	1.06	9	1	1	1	1.25	80	4.54	$0.20	$0.21
C.C.C. State	4.47	30	52	0	52	1.73	270	17.30	.52	5.36
Total	4.73	39	42	[illegible]	42	1.68	217	33.46	.48	2.48

Table 86.- Acres Table Fire Protected, Classified According to Ownership, Indiana, 1935

Ownership	Agency supplying labor	Acres W.P. protected	Percent of total
State	C.C.C.	125	43
Private	C.C.C.	160	55
Total		285	100

been given for the areas to overlap last year's work so as to be sure the first will have satisfactory protection. At Martinsville one area was found to be unsatisfactorily protected and was reworked. The cost of reworking was charged against the original cost of eradication. No official checking records were kept, but all of the areas with the exceptions noted were satisfactorily protected.

Nursery Sanitation

There are three state nurseries producing white pine for forestry purposes in Indiana. Nursery sanitation work was performed around these three nurseries in 1933 on E.C.W. funds. Fortunately, with the exception of a small number of cultivated gooseberries in two locations, these three nurseries are in a practically Ribes-free condition. These cultivated bushes will be removed. In Table 37 it may be noted that 115 Ribes were removed from 2,481 acres covered to protect 70 acres in the three nurseries. Another state-owned white pine nursery at the Dunes State Park should be worked during the 1934 season. This nursery is in the extreme northwestern corner of the state. This is a rather dangerous project as 300 or 400 acres of swamp land necessary to be worked are infested with northern swamp rattlesnakes according to the nursery superintendent.

Costs

In Table 38 are shown the total costs of the blister rust control project in Indiana in 1933.

With the exception of contributed services from the state, all funds for control work came from the E.C.W. program.

In Tables 39 and 40 the funds shown in Table 38 have been computed in percentages.

Summary and Conclusions

In 1933 on E.C.W. funds all known worth-while white pine stands in the state were covered by pre-eradication surveys. Approximately 60 per cent of these pine stands were given initial protection.

Three of the four state nurseries were put in a sanitary condition.

It is expected that in 1934 the remaining white pine stands will be given protection. Those stands within the working radii of E.C.W. camps will be protected on E.C.W. funds and stands outside of such radii will be protected on W.P.A. or other funds.

Table 87.- Nursery Sanitation, All First Working, E.C.W., Indiana, 1935

County	Ownership	No. jobs	Acres protected in nursery	Acres worked			Ribes pulled			Man-days		Costs		
				Crew	Scout	Total	Crew	Scout	Total	Labor	Supervision	Labor	Supervision	Total
Clark	State	1	46	10	921	1 931	61	0	61	10	7	$20.00	$50.00	$70.00
Jackson	State	1	4	0	450	1 450	0	0	0	0	2	-	20.00	20.00
Sullivan	State	1	20	0	1,200	1 1,200	0	54	54	-	2½	-	25.00	25.00
Total		3	70	10	2,571	2,581	61	54	115	10	11½	$20.00	$95.00	$115.00

1 Includes some planting of white pine near nurseries

Table 88.- State and Federal Expenditures for all Blister Rust Control Projects, Indiana, 1933.

Agency	Expenditure classification	Supervision	Ribes eradication	Nursery sanitation	Pre-eradication survey	Checking	Other field data	Equipment and misc.	Total
State	Salaries	$50.00							$50.00
	Expenses	120.00			$50.00			$50.00	220.00
	Total	170.00			50.00			50.00	270.00
State E.C.W.	Salaries		$547.49	$80.00	300.00	$20.00	$37.00		984.49
	Expenses		109.01	35.00	210.23	20.00	37.00		411.24
	Total		656.50	115.00	510.23	40.00	74.00		1,395.73
Total	Salaries	50.00	547.49	80.00	300.00	20.00	37.00		1,034.49
	Expenses	120.00	109.01	35.00	260.23	20.00	37.00	50.00	631.24
	Total	170.00	656.50	115.00	560.23	40.00	74.00	50.00	1,665.73

Table 89.- Percent of each Agency expenditure spent on each Project, Indiana, 1933.

Agency	Super-vision	Ribes eradi-cation	Nursery sanita-tion	Pre-eradi-cation survey	Checking	Other field data	Equipment and misc.	Total
State	63.0			18.5			18.5	100.0
State F.C.W.		47.0	8.2	36.6	2.9	5.3		100.0
Total	19.3	39.4	6.9	33.0	2.4	4.6	3.0	100.0

Table 90.- Percent of each Project expenditure spent by each Agency, Indiana, 1933.

Agency	Super-vision	Ribes eradi-cation	Nursery sanita-tion	Pre-eradi-cation survey	Checking	Other field data	Equipment and misc.	Total
State	100.0			8.9			100.0	16.2
State F.C.W.		100.0	100.0	91.1	100.0	100.0		83.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

History of Rust

Prior to 1915, blister rust had been found at two nurseries, the W. Kess Nursery at Akron on white pine imported from E. T. Dickinson, Chatenay, France, in 1910; and the Storrs and Harrison Nursery, Painesville, on white pine imported from France in 1910 and 1911.

Diseased white pine had been shipped from J. Jenkins Nursery at Winona in the spring of 1911 to I. Hicks & Son, Westbury, Long Island, N.Y.

One infected pine was found in 1918 at the Storrs and Harrison Nursery, Painesville, from the same stock of pines imported from France. The entire pine stock was destroyed in 1918.

From 1917 to 1920 scouting work was conducted by Federal employees in cooperation with the State Nursery Inspection Service. Major emphasis was placed on inspection of planted white pine from infected nurseries. No rust was found except on two infected pines found in 1917 at a nursery near Cuyahoga Falls in Summit County. These were in a lot of 1,000 pines imported from a Minnesota nursery in 1915. This entire shipment was destroyed in 1917.

No further work was done until 1931 when Waters, Sheals and Pierce made a short scouting trip to the northern portion of the state. They found blister rust on Ribes at four locations in the extreme northeastern corner of the state and one in the northwestern corner. At three of these locations infection was found on Ribes nigrum and two on R. cynosbati.

In 1932 the only work done was a 2-day trip through Ohio made by Putnam principally for the purpose of interviewing officials regarding blister rust control work. No rust was found.

Status of the Rust

In 1933 a short scouting trip was made by Dowd and Morrison in northeastern Ohio. They found one infection on R. nigrum. The number of infections known in Ohio to December 31, 1933, are shown in Table 91.

Organization

Control work in Ohio in 1933 was performed by the state E.C.W. Bureau from the Waldeck Valley camp near Londonville.

On September 1 a state leader, O. J. Dowd, was appointed on W.P.A. funds to supervise all control work in the state under a cooperative of

Table 91.- [illegible] in Ohio, 1910 to 1933.

Location	County	Host infected	Year found	Remarks
R. Haas nursery Akron	Summit	White pines	1910	Pines imported from Chabanay, Fr[illegible]
Storrs & Harrison nursery Painesville	Lake	do	1910 1911 1916	10,000 pines imported from Orleans, Fr., in 1909. Infected pine in 1911 was from same lot as those found infected in 1910 and 1911. No Ribes infection seen. Remainder of pine lot destroyed December, 1916.
J. Jenkins nursery	Columbiana	do	1911	Diseased pines shipped from Jenkins nursery in 1911 to I. Hicks & Son, L.I., N.Y. Infection discovered at destination.
Nursery near Cuyahoga Fall	Summit	Two small white pines	1917	1,000 white pines imported from a Minnesota nursery in 1915. All remaining white pine (662) of this lot were destroyed in 1917. No Ribes infection found.
One mile west of Williamsfield along road	Ashtabula	1 R. cynosbati heavily infected	8/5/31	Found by Sheals and Pierce uredinial stage. Many other R. cynosbati examined. No infection.
Mr. Kelly Monroe Center.	do	R. nigrum one bush	8/5/31	These two places found by Sheals and Pierce are about 1/2 mile apart. Many R. cynosbati examined. None found infected.
J. C. Anderson Monroe Center	do	R. nigrum several bushes	8/5/31	
Two miles east of Fayette	Fulton	R. cynosbati; one bush	8/6/31	Found by Sheals and Pierce. Numerous R. cynosbati examined and found infected.
Four miles west of Harts Grove. Three miles east of Montville.	Geauga	R. nigrum	8/28/31	Found by Sheals.
Kellogsville	Ashtabula	R. nigrum	1933	Found by Dowd and Morrison.

understanding drawn up between the State Department of Forestry, the State Division of Plant Industry, and the U. S. Department of Agriculture. Fifteen thousand dollars of W.P.A. funds were allotted to perform control work under this memorandum of understanding in Ohio. Under the W.P.A. program a considerable amount of local control work was performed in September and October.

On December 15, 1933, C.W.A. funds were allotted for the purpose of making a state-wide white pine survey. Four C.W.A. foremen were employed on this project, each paid $1.20 per hour for a 30-hour week. Each man paid his own subsistence and travel expenses.

Distribution of White Pine

White pine originally was native throughout northeastern Ohio where it is still found in scattered tracts in mixture with hemlock and/or hardwoods.

Today Ohio has four major areas of native white pine. Each of these pine areas is located on land unsuited to agricultural development. Many of the areas are found along river banks. While much of the native white pine has been logged off, the present stands are reseeding themselves in a very satisfactory manner. The locations of these native areas are as follows: The Little Mountain Area, in Lake and Geauga Counties, is the only virgin forest of its kind in the state. This area contains 280 acres of native white pine in addition to 85 acres of white pine plantations.

The Little Beaver area located along the Little Beaver River and its tributaries in Columbiana County on the eastern side of the state, contains approximately 300 acres of white pine.

The Mohican River area lying along the Mohican River and its tributaries in Ashland, Knox, and Holmes Counties, is the largest and most important area. It contains over 1,200 acres of white pine. Much of the pine is second growth.

The Vermilion River area, located along the Vermilion River and its tributary, Chance Creek, in Erie County in the north central part of the state, contains several hundred acres of white pine.

The earliest white pine planting in Ohio was made about 1880 in Ashtabula County by M. F. Dean. These white pine now average about one foot D.B.H. and about 60 feet in height.

Interest in white pine planting has grown since 1908 when the Ohio Agricultural Experiment Station forest nursery began to supply trees for forest plantings. From 1908 to 1932, inclusive, 943 plantings and 1,146,101 white pine trees were planted. In 1932, 20 percent of the planting stock used on state forests was white pine. Other percentages were short leaf pine, 37 percent, hemlock, 15 percent, red pine 9 percent, Scotch pine, 9 percent, tulip poplar, 7 percent, all others, 4 percent.

White pine is reseeding from seed trees in a very satisfactory manner in Ohio. It is seeding in on abandoned fields from native seed trees and is also coming up from seed produced in some of the older plantings. At the Ohio Experiment Station at Wooster there is a shelterbelt planted many years ago. Seeds from this shelterbelt produced new trees which in turn have nowproduced seeds from which other trees are growing. Thus from a single shelterbelt planting there are three generations of white pine trees present.

Pre-eradication Surveys

Prior to the actual eradication work performed on white pine areas near Camp Mohican, A. E. Fivaz of the Washington Office assisted T. C. Green, state E.C.W. checker, in making a brief preliminary survey of the areas to be worked on E.C.W. funds near Loudenville.

Following the E.C.W. Ribes eradication at Camp Mohicnn, Mr. Green made pre-eradication surveys of areas to be worked in 1934.

Men employed on N.R.A. funds following the eradication season in the fall, made pre-eradication surveys particularly around planted white pine areas.

The results of these various pre-eradication surveys are shown in Table 92.

Table 92.- Pre-eradication Surveys, Ohio, 1933

Program	No. areas	Acres w.p. to protect	Acres to work	Estimated man-days labor required
State E.C.W.	1	156	1,400	700
N.R.A.	47	406	5,713	114
C.W.A.	3	880	2,600	460
Total	51	1,442	9,713	1,274

Local Control

Local control was performed under the E.C.W. and N.R.A. programs.

Work on the E.C.W. program was limited to the Mohican River area, Ashland County, near Loudenville. A. E. Fivaz trained T. C. Green, blister rust checker, for about 10 days while the work was being organized. Four 6-man crews of C.C.C. enrollees were used on the area from about August 1 to October 14. Mr. Green was assisted by R. Rhoades on N.R.A. funds from September 18 to October 17. Good work was accomplished and the C.C.C. boys took an interest in the project.

Table 93.- Local Control, Ohio, 1933.

Area	Owner-ship	No. jobs	Acres W. p. pro-tected	Acres worked			Ribes pulled			Man-days		Costs		
				Crew	Scout	Total	Crew	Scout	Total	Labor	Super-vision	Labor	Super-vision	Total
						State E.C.W.								
Mohican	State	1	308	308	0	308	21,175	0	21,175	1,061	34	3,180.75	102.00	3,282.75
						E.R.A.								
Dean	State	1	50	0	170	170	0	0	0	0	4	0	20.00	20.00
Shawnee	do	1	27	0	320	320	0	0	0	0	3	0	16.32	16.32
Waterloo	do	1	14	199	0	199	100	0	100	60	7	180.00	29.91	209.91
Little Mt.	Private	1	299	292	0	299	10,394	0	10,394	348	52	1,050.65	220.56	1,271.21
Brinkhaven	do	1	112	156	0	156	10,084	0	10,084	297	61	716.29	241.32	957.61
Greer	do	1	138	194	0	194	12,905	0	12,905	221	34	876.82	145.83	1,022.65
Carbondale	do	1	40	390	0	390	845	0	845	120	14	360.00	49.17	409.17
Sub-total		7	680	1,235	490	1,725	34,328	0	34,328	1,046	175	3,183.76	722.11	3,905.87
Total		8	988	1,543	490	2,033	55,503	0	55,503	2,107	209	6,364.51	824.11	7,188.62

1 Supervision paid on E.C.W. funds except for a foreman 1 month, $110.00, paid for on N.R.A. funds.
C.C.C. labor based on $2.75 per 6-hour man-day plus transportation cost.
W.R.A. labor based on $0.50 per, 6-hour day, or $3.00 per man-day.

Table 94.- Ribes Pulled and Costs per Acre, Initial Eradication, Ohio, 1933.

Agency	Acres worked to protect one acre white pine	Percent total area worked by crew	Ribes pulled per acre			Acres worked per man-day			Cost per acre	
			Crew	Scout	Total	Crew	Scout	Total	Worked	Pine protected
C.C.W.	3.0	100.0	45.3	0	45.3	0.85	0	0.85	$3.78	$11.36
N.R.A.	2.5	71.6	27.7	0	18.8	1.18	[1]70	1.64	2.26	5.75
Total	2.7	91.1	34.1	0	27.7	1.02	70	1.26	2.77	7.63

[1] Based on 7 days of supervision devoted entirely to scouting.

The N.R.A. control program was supervised by State Leader Dowd and performed during the period September 11 to October 10. Three projects were worked on state land and four on private land.

Five foremen each had charge of 12 N.R.A. laborers at $0.50 per hour for a 30-hour week. The 12 laborers were divided into two 5-man crews each with a strawboss. These crew laborers worked either as 10-man line under supervision of two strawbosses and the foreman or as separate units of 6 men each a short distance from each other.

String was used to mark the limits of crew strips on both the E.C.W. and N.R.A. work.

In Tables 93, 94 and 95 are shown control work performed in Ohio in 1933, costs, per acre figures, and ownership.

Table 95.- Acres White Pine Protected, Ohio, 1933, Classified by Program and Ownership

Program	Ownership classes: Private	State forests	Total	Percent of total
N.R.A.	589	91	680	70.0
State - E.C.W.	0	289	289	30.0
Total	589	380	969	
Percent	60.8	39.2		100.0

Nursery Sanitation

Nursery sanitation was performed around one state nursery at Marietta with N.R.A. funds and at one privately owned nursery at Winona using nursery labor. The Marietta state nursery is fortunate in occupying a Ribes-free site. On 857 acres comprising the nursery sanitation zone around this nursery, 194 cultivated Ribes were destroyed. No wild Ribes were found.

In Table 96 is shown a statement of nursery sanitation performed in Ohio in 1933.

At Wooster is situated an excellent coniferous arboretum. Many species of conifers, both native and exotic, are growing here. There are at least 7 different species of white pine. In connection with the arboretum there is a state nursery. The whole area should be protected in 1934. Several hundred cultivated red currants are within the 1,500-foot

Table 96.- Nursery Sanitation, Ohio, 1933.

Nursery	Owner-ship	Work-ings	Acres pro-tected in nursery	Acres worked			Ribes pulled				Man-days		Costs		
				Crew	Scout	Total	C.B.C.	Other Cult. Ribes	Wild Ribes	Total	Labor	Super-vision	Labor	Super-vision	Total
Marietta; Marietta	State	1st	98	857	0	857	0	194	0	194	237	38	[1] $718.58	$202.98	$921.56
Jenkins; Winona	Private	1st	5	100	0	100	0	0	3.100	3,100	8	4½	[2] $27.50	[3] 0	$27.50
Total			103	957	0	957	0	194	3,100	3,294	245	42½	$746.08	$202.98	$949.06

1 All W.P.A. costs. Labor based on 6-hour day at $0.50 per hour or $3.00 per man-day.
2 Labor costs, Jenkins nursery, based on 55 hours nursery labor at $0.50 per hour.
3 Supervision, 35 hours, by R. A. Sheals of Bureau of Plant Quarantine, no cost listed.

sanitation zone but they are growing on the Experiment Station grounds and arrangements can undoubtedly be made to have them moved to another place on the grounds outside of the 1,500-foot limit.

The nursery sanitation work around the Jenkins nursery at Minonk was supervised by R. A. Sheals of the Bureau of Plant Quarantine. No charge is shown for this supervision.

Informational Activities

No organized attempt was made on informational activities as the entire stress was placed on getting unemployed men to work under the N.R.A. program. The work done along this informational line is as follows:

Items published - - - - - - - - -	3
Circular letters sent - - - - - -	45
Publications distributed - - -	150
Initial interviews - - - - - - -	481
Follow-up calls - - - - - - - - -	36
Personal field instruction - - -	171

Costs

In Table 97 are shown the total costs of the control program in 1933 in Ohio. It may be noted that a grand total of $11,414.39 was spent. Of this total $10,193.98, or approximately 89 percent, was spent for salaries and wages. In Tables 98 and 99 the figures in Table 97 are shown as percentages.

In Table 98 each agency's contribution has been expressed as a percentage charged to each project. It may be noted in Table 98 that nearly 92 percent of the state E.C.W. funds were spent on actual eradication while N.R.A. funds were spent chiefly on Ribes eradication, pre-eradication surveys, and general supervision.

In Table 99 the funds charged to each project are shown as percentages spent by each agency. It may be noted that the major supervisory costs were incurred on state and N.R.A. funds. Eradication costs were largely borne by the N.R.A. and state E.C.W. programs. Pre-eradication surveys were paid for chiefly on N.R.A. funds with a limited percentage of the costs of this project paid for on state E.C.W. and C.W.A. funds.

Nearly 2/3 of the funds spent in Ohio were N.R.A. funds. Thirty percent was contributed by the state E.C.W., 2.6 percent by the C.W.A., and practically 5 percent by the state.

Summary and Conclusions

In Ohio, white pine is used extensively for reforestation purposes. White pine is also reseeding itself in a very satisfactory manner in the state and in several instances is taking over old fields in a manner similar to New England.

Table 37.- State and Federal Expenditures for all Blister Rust Control Projects, Ohio, 1948.

Agency	Expenditure classification	Supervision	C.E.C. activities	Other activities	Nursery inspection	Pre-eradication survey	Checking	Equipment and misc.	Total
State	Salaries	$210.00			$27.50			$176.00	$413.50
	Expenses							25.00	50.00
	Total	310.00			27.50			176.00	487.50
U.S.F.S.	Salaries	459.30	$ 341.42	$ 3,736.32	170.43	$ 431.00	$ 13.14		5,241.21
	Expenses	306.06	74.60	281.55	33.05	682.66	22.10	50.00	1,710.41
	Total	757.36	416.02	4,016.87	203.14	1113.67	35.24	50.00	7,118.15
State & U.S.F.S.	Salaries	15.86	65.82	3,184.31		185.61			5,449.76
	Expenses							20.00	20.00
	Total	15.86	24.82	3,184.31		189.61		20.00	5,469.76
C.C.C.	Salaries		14.32			205.68			220.00
	Expenses								
	Total		24.32			205.68			220.00

Table 38.- Percent of each Agency Expenditure spent on each Project, Ohio, 1933.

Agency	Super-vision	B.R.C. agent activities	Ribes eradi-cation	Nursery sanita-tion	Pre-eradi-cation survey	Checking	Equipment and misc.	Total
State	55.1			4.9			40.0	100.0
N.R.A.	10.3	5.9	56.4	12.9	12.4	1.1	1.0	100.0
State ECW	.4	1.9	91.8		5.3		.6	100.0
C.W.A.		29.2			70.8			100.0
Total	4.2	4.0	47.2	4.4	11.1	.4	28.7	100.0

Table 39.- Percent of each Project Expenditure spent by each Agency, Ohio, 1933.

Agency	Super-vision	B.R.C. agent activities	Ribes eradi-cation	Nursery sanita-tion	Pre-eradi-cation survey	Checking	Equipment and misc.	Total
State	29.2			2.9			76.3	4.9
N.R.A.	69.5	73.6	55.9	97.1	69.5	100.0	16.9	62.3
State ECW	1.3	11.5	44.1		14.4		6.8	30.2
C.W.A.		14.9			16.1			2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Pre-eradication surveys were performed in 1933 and will be continued in 1934. It is hoped that all worth-while stands will have been found and pre-surveyed before the end of the 1934 field season.

Under the state E.C.W. and N.R.A. programs a total of 969 acres of white pine were protected by the removal of 71,806 Ribes from 2,594 acres at a cost of 1,046 man-days of labor and 175 man-days supervision.

The largest state nursery producing white pine and one private white pine producing nursery were initially protected in 1933.

Blister rust is known to exist in the northeastern and northwestern portions of the state but so far has not been found outside of these two regions.

It is hoped that by the end of the 1934 field season the majority of worth-while stands of white pine will have been given initial protection against blister rust.